

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

TECHNIQUE

JANUARY, 1937.

**Effect of variations in atmospheric carbon dioxide on the respiratory quotient and alkaline reserve of the frog.** L. DONTCHEFF and C. KAYSER (*Compt. rend. Soc. Biol.*, 1936, 123, 815—817).—Retention of CO<sub>2</sub> is practically nil with atm. [CO<sub>2</sub>] of 0.6% and is const. with concns. of 0.9—2.2%.

H. G. R.

**Effect of variations in atmospheric temperature on the respiratory quotient and alkaline reserve of the frog.** C. KAYSER (*Compt. rend. Soc. Biol.*, 1936, 123, 818—820).—On lowering the temp. CO<sub>2</sub> is retained, but after 24 hr. the R.Q. returns to normal.

H. G. R.

**Stack of constant volume for human respiration experiments.** F. G. BENEDICT (*J. Biol. Chem.*, 1936, 116, 307—320).—The principle of the apparatus depends on the stratification of the expired air at the bottom of the stack by control of temp. and humidity, and its slow diffusion with external air already in the stack.

P. G. M.

**[Determination of the] partial pressure of oxygen in arterial blood.** F. K. HICK (*Proc. Soc. Exp. Biol. Med.*, 1936, 33, 582—587).—A modification of the aerotonometer method is described. Healthy persons exhibited appreciable differences as regards the O<sub>2</sub> saturation and tension of their blood, the average vals. being 96.1% and 79.5 mm. In diseased persons saturation was <93% and in persons exhibiting anoxæmia the tension was > would be expected from the saturation val.

W. McC.

**Gaseous composition of blood during anaphylactic shock.** A. M. MELIK-MEGRABOV (*Ukrain. Biochem. J.*, 1936, 9, 713—718).—The O<sub>2</sub> of arterial blood of rabbits falls by 50% during anaphylactic shock. A theory to account for this is advanced.

F. A. A.

**Mechanism of the aggregation of erythrocytes.** B. SWEDIN (*Biochem. Z.*, 1936, 288, 155—206).—Electrodialysis of ox blood corpuscles (washed 1—3 times with physiological aq. sucrose) produces aggregation and subsequent hydrolysis as the concn. of electrolyte diminishes. Addition of increasingly small amounts of KCl, NaCl, or HCl to the aggregated suspension produces dispersion of the corpuscles; this action does not occur with FeCl<sub>3</sub>, CaCl<sub>2</sub>, or NaOH. The crit. concn. of Na<sup>+</sup>, K<sup>+</sup>, or Cl<sup>-</sup> for dispersion corresponds with a unimol. layer of hydrated ions completely covering the surface of the corpuscles; the ions are not absorbed. Corpuscles aggregated by electrodialysis and kept in a closed vessel for 3—4 hr. spontaneously disperse;  $\kappa$  of the suspension medium simultaneously increases. Aggregation is not accom-

panied by changes in resistance to hypotonicity or in cholesterol content. The aggregation by viscous preps. of salep or Na thymonucleate is not accompanied by adsorption or, as also with tragacanth gum or citrated plasma, changes in  $\eta$ ; such aggregation is inhibited by electrolytes in concn. approx. thrice that necessary for dispersion of corpuscles aggregated by electrodialysis. The determination of erythrocyte sedimentation rate by optical methods indicates that approx. 90% of the incident light is dispersed from the corpuscular surface, but the val. decreases on aggregation. The characteristics of normal and pathological erythrocytes under varying conditions are described.

F. O. H.

**Cholesterol content of human red blood corpuscles.** G. C. BRUN (*Biochem. Z.*, 1936, 287, 420—423).—Normal human erythrocytes contain only free cholesterol (I) and no esterified (I). The (I) content varies within very narrow limits (mean 0.140%) and is the same for cells of the blood of both sexes.

P. W. C.

**Permeability of erythrocyte membrane after hypotonic hæmolysis.** E. PONDER (*Proc. Soc. Exp. Biol. Med.*, 1936, 33, 630—633).—The osmotic and electrical behaviour of the ghosts obtained on "reversing" hæmolysis in suspensions of erythrocytes indicates that membranes surrounding the ghosts are highly semipermeable. Since the membranes are semipermeable when hæmolysis occurs, it is possible that they undergo "repair" after lysis.

W. McC.

**Purine content of thrombocytes and erythrocytes.** F. KOLLER (*Z. physiol. Chem.*, 1936, 244, 23—30).—In human and ox thrombocytes approx. 2% of the total N occurs as purine-N. The corresponding val. for the erythrocytes appears to be 0.15—0.3%. In the erythrocytes of the hen the val. is 3.5% and in the thymus of the calf 11—12%. These vals. suggest that purines are characteristic constituents of the nuclei of cells and that the nuclei of the megacaryocytes are concerned in the production of thrombocytes.

W. McC.

**Chondriome from the red cells of vertebrate blood.** P. JOYET-LAVERGNE (*Compt. rend. Soc. Biol.*, 1936, 123, 754—755).—This has similar properties to chondriome in general.

H. G. R.

**Lipin content and number of white blood cells.** E. M. BOYD and D. J. STEPHENS (*Proc. Soc. Exp. Biol. Med.*, 1936, 33, 558—560).—In the blood of 25 patients no relation could be traced between the no. of leucocytes and the total lipin, neutral fat, fatty acid, total, free, and esterified cholesterol (I), or phospho-

lipin (II) contents. The free (I) and (II) contents varied in parallel. W. McC.

**Change of phagocyte under influence of sodium bromide or iodide.** L. VAJDA (Orvosi Het., 1935, 79, 941—947).—Corpuscles of phagocytes are decomposed by treatment with aq. NaBr or NaI.

CH. ABS. (p)

**Total dissociation of horse hæmoglobin.** J. STEINHARDT (Nature, 1936, 138, 800—801).—In unbuffered dil. salt solutions at the isoelectric point, the native hæmoglobin of the horse is totally dissociated into mols. of half the normal mol. wt. when high concns. of urea,  $\text{NH}_2\text{Ac}$ , or  $\text{HCO}\cdot\text{NH}_2$  are present. There is no evidence of denaturation. Methæmoglobin (I) and alkaline hæmochromogen prepared from totally dissociated protein are spectroscopically unchanged, and the process of denaturation is still required for the production of hæmochromogen. (I) changes within a day to a substance with a parahæmatin spectrum. The bearing of these results on current theory is discussed. L. S. T.

**[Characteristics of] human blood. V. Determination of hæmoglobin, erythrocyte count and dimensions, and hæmoglobin content per erythrocyte and per  $\mu^2$  of erythrocyte surface in old persons.** H. BIEDENKOPF (Z. Biol., 1936, 97, 445—453).—Average vals. for 20 men and 20 women aged 60—70 years were, respectively, hæmoglobin (I) content 15.89, 15.06%; erythrocyte count  $5.00, 4.67 \times 10^6$  per cu. mm.; (I) content per erythrocyte 31.9,  $32.3 \times 10^{-12}$  g.; erythrocyte diameter 8.00, 7.93  $\mu$ ; erythrocyte surface 100.6, 98.8  $\mu^2$ ; (I) content per  $\mu^2$  of erythrocyte surface 31.7,  $32.8 \times 10^{-14}$  g. The data are compared with corresponding vals. for young people. F. O. H.

**Thermochemistry of the oxygen-hæmoglobin reaction. II. Comparison of the heat as measured directly on purified hæmoglobin with that calculated indirectly by the van 't Hoff isochore.** F. J. W. ROUGHTON [with G. S. ADAIR, J. BAROROFF, S. GOLDSCHMIDT, W. HERKEL, R. M. HILL, A. B. KEYS, and G. B. RAY] (Biochem. J., 1936, 30, 2117—2133).—The heat of reaction of  $\text{O}_2$  with purified hæmoglobin solutions, measured directly, agrees within experimental error with the heat of reaction calc. by the van 't Hoff isochore from the effect of temp. on the  $\text{O}_2$  dissociation curves, both at  $p_{\text{H}}$  6.8 (9350 g.-cal.) and  $p_{\text{H}}$  9.5 (13,300 g.-cal.). The existence of intermediate compounds is discussed. It is shown that calc. and measured heats of reaction should agree even in the presence of foreign buffers.

F. A. A.

**Action of sodium azide on cellular respiration and on some catalytic oxidation reactions.** D. KELLIN (Proc. Roy. Soc., 1936, B, 121, 165—173).—Methæmoglobin forms a compound with  $\text{NaN}_3$ , the brown solution turning red and showing absorption bands at 575 and 542.5  $m\mu$ . One mol. of  $\text{NaN}_3$  is consumed per Fe atom.  $\text{NaN}_3$  inhibits the activity of indophenol and pyrocatechol oxidases, catalase, peroxidase, and the oxidation of cysteine by hæmatin. The  $\text{O}_2$  uptake of yeast is also inhibited, at  $p_{\text{H}} < 7.5$ .

F. A. A.

**Relationship between globular volume and concentration of iron. Significance of the hæmatocrit value.** W. L. DULIERE and M. ADANT (Bull. Soc. Chim. biol., 1936, 18, 1589—1599).—The concn. of Fe and of hæmoglobin and the capacity for fixation of  $\text{O}_2$  of red corpuscles can be deduced from the globular vol. of the venous blood, the accuracy being within 5—6%. In many cases the hæmatocrit val. gives an indication of the no. of red cells. P. W. C.

**Ultra-violet spectrum of hæmoglobin and its derivatives.**—See A., I, 8.

**Extravisceral origin of bilirubin in man. I. Arterial and venous blood-bilirubin. Venous blood-bilirubin after stasis.** G. C. DOGLIOTTI and E. SLAVICH (Boll. Soc. ital. Biol. sperim., 1936, 11, 665—666).—Normally the bilirubin (I) levels of arterial and venous blood are equal, but in hyperbilirubinemia the latter is sometimes slightly the higher; also, blood stasis increases blood-(I), whilst the effect is less marked in normal men. F. O. H.

**Blood of *Alligator mississippiensis*.** M. B. ROSENBLATT (J. Biol. Chem., 1936, 116, 81—86).—Detailed analyses are given of alligator blood in spring. There is a reversed albumin-globulin ratio of the blood plasma-proteins and a high cellular non-protein-N. These findings are discussed from a phylogenetic point of view. J. N. A.

**Properties of blood-albumin of the horse.** M. GRINSTEIN (Anal. Asoc. Quím. Argentina, 1936, 24, 30—46).—The purified albumin (cf. A., 1936, 1400) has an isoelectric point of  $p_{\text{H}}$  5.0, Au no. approx. 0.04, and  $[\alpha] - 61.15^\circ$ . The absorption spectrum and  $n$  for aq. solutions are also recorded.

F. R. G.

**Proportion of albumin to globulin in serum of healthy animals.** A. WLADASCH (Biochem. Z., 1936, 287, 337—341).—Vals. for the total protein, albumin (I), and globulin (II) contents and the (I)/(II) ratios of horse, ox, hen, and dog serum are tabulated. The abs. vals. with horse and ox serum differ little from one another and the ratio of (I)/(II) is approx. 1. In dogs, however, the (I), and in hens the (II), content considerably predominates. P. W. C.

**Protein and water of serum and cells of human blood. Measurement of red cell volume.** A. J. EISENMAN, L. B. MACKENZIE, and J. P. PETERS (J. Biol. Chem., 1936, 116, 33—45).—Equations give the relations between  $\text{H}_2\text{O}$  and protein in serum and hæmoglobin (I) in cells, and  $\text{H}_2\text{O}$  and protein in cells. For normal adults the mean concns. of (I) and protein per 100 c.c. of cells are 32.7 g. and 33.1 g., respectively. J. N. A.

**Autoclave decomposition of blood-albumin by carbonate.** V. S. SADIKOV, G. NOVOSELOVA, and V. ROZANOVA (Ukrain. Biochem. J., 1936, 9, 779—790).—The distribution of N between  $\text{NH}_2\text{-N}$ , cyclopeptide-N, and heterocyclic N of the  $\text{Et}_2\text{O}$  and  $\text{CHCl}_3$  extracts of the solid and liquid phases resulting from the carbonate decomp. of blood-albumin is described. F. A. A.

**Maternal and foetal blood: proteins and polypeptides.** M. CHAMBOX and S. CELLIERE (Compt.

rend. Soc. Biol., 1936, 123, 595—596).—The polypeptide content of foetal is > that of maternal blood.

H. G. R.

**Variations in blood-polypeptides and -proteins during uterine involution in the postpartum period.** M. CHAMBERON and S. CELLIERE (Compt. rend. Soc. Biol., 1936, 123, 597—599).—The polypeptides immediately increase and reach a max. after 6 days.

H. G. R.

**Double nitrogen [determinations for evaluation of the peptide-nitrogen of blood]. Nature of the constituent fractions.** R. MARTENS (Bull. Soc. Chim. biol., 1936, 18, 1551—1568).—Determinations of the peptide-N on certain pathological cases are made by the "double N" method (cf. A., 1929, 339). The  $\text{NH}_2$ -acid contents of the  $\text{CCl}_3\text{-CO}_2\text{H}$  and phosphotungstic acid (I) filtrates are frequently not identical, especially when the serum polypeptide-N is abnormally high. Determination of the non-protein-N of these filtrates after addition to the serum of arginine, lysine, histidine, or proline shows that a considerable amount of the first two acids is pptd. by (I). Determination of  $\text{NH}_2\text{-N}$  before and after hydrolysis shows that (I) filtrates contain complex mols. Leucylglycylglycine and glutathione are not, however, pptd. by (I). The (I) ppt. contains some substances which are neither protein nor polypeptide.

P. W. C.

**Simplification of the Permutit process for determination of histamine in the blood.** A. SCHWARTZ and A. RIEGERT (Compt. rend. Soc. Biol., 1936, 123, 801—804; cf. A., 1936, 1530).—10 c.c. of plasma are shaken with 1 g. of Permutit for 1 hr., and histidine is eluted with saturated aq. NaCl and determined by Pauly's reaction.

H. G. R.

**Lipin content of livers of non-immunised and immunised horses.** A. WADSWORTH, J. W. HYMAN, and R. R. NICHOLS (Amer. J. Path., 1935, 11, 419—427).—In immunised horses vals. for phospholipins (I) were <, and for free cholesterol (II) and neutral fats >, those in non-immunised or resting horses. The ratio (I)/(II) is related to the extent of the injury resulting from immunisation with bacterial toxins.

CH. ABS. (p)

**Lipin-protein combination in blood-serum. Analysis of physico-chemical factors of the extractability of serum-lipins by ether in presence of various substances.** B. DELAGE (Bull. Soc. Chim. biol., 1936, 18, 1603—1612).— $\text{Et}_2\text{O}$  extracts only traces of lipin from blood-serum. One group of substances, e.g., the primary alcohols, cyclohexanol,  $\text{COMe}_2$ , added to the serum enable  $\text{Et}_2\text{O}$  to extract in the cold 60—80% of the total lipin present, whereas another group, e.g., glycols, and variation of  $p_{\text{H}}$  have no such effect. Substances of the first group are sol. in  $\text{Et}_2\text{O}$  and considerably lower the  $\text{Et}_2\text{O-H}_2\text{O}$  interfacial tension, whilst those of the second group are almost insol. in  $\text{Et}_2\text{O}$  and only slightly depress the interfacial tension.

P. W. C.

**Extractability of serum-lipins by ether as a function of  $p_{\text{H}}$ .** B. DELAGE (Bull. Soc. Chim. biol., 1936, 18, 1600—1602).—Adjustment by  $N\text{-NaOH}$  or  $N\text{-H}_2\text{SO}_4$  of the  $p_{\text{H}}$  of serum to vals. between 1.7 to

13.3 hardly affected the amount of lipin extracted by  $\text{Et}_2\text{O}$  at  $20^\circ$ .

P. W. C.

**Gravimetric determination of small amounts of plasma-lipins.** H. R. STREET (J. Biol. Chem., 1936, 116, 25—31).—The method determines total lipins in 2—5 c.c. of plasma. Bloor's oxidative method (A., 1928, 662) gives vals. 9.2—15.9% < those given by the new method.

J. N. A.

**Unknown substances in the unsaponifiable fraction of blood.** W. BRANDT (Biochem. Z., 1936, 283, 257—260).—The cholesterol-free unsaponifiable fraction of blood-lipins (ox, man) yields an oil (partly cryst. at low temp.), free from N and P, and giving positive sterol colour reactions and ppts. with picric and picrolonic acids but not with digitonin. This substance is probably a source of error in determinations of blood-cholesterol.

F. O. H.

**Ultra-violet spectrographic determination of free and conjugated phenols in pure solution and in blood.** G. BARAC (Bull. Soc. chim. Belg., 1936, 45, 641—646).—The usual methods of observing the fate of PhOH in mammalian blood are inaccurate; PhOH and  $\text{PhKSO}_4$  contents of aq. and of blood solutions can be accurately determined by ultra-violet spectrographic examination of an  $\text{Et}_2\text{O}$  extract.

R. F. P.

**Effect of glucose ingestion on cholesterol fractions of blood.** W. M. SPERRY (J. Biol. Chem., 1936, 116, 65—70).—In contrast to the findings of Fitz and Bruger (A., 1936, 496) employing abnormal patients, there was no significant change in the concn. of total and free cholesterol in blood-serum when determined before and after administration of glucose in healthy man.

J. N. A.

**Cases of high blood-sugar without glycosuria.** R. H. MAJOR (J. Lab. Clin. Med., 1935, 20, 1111—1112).—High blood-sugar vals. in these cases are due to fermentable sugars only.

CH. ABS. (p)

**Effect of intravenous, subcutaneous, and intramuscular injections of acetylcholine on blood-sugar.** F. JOURDAN, P. GALY, and L. GALLONI (Compt. rend. Soc. Biol., 1936, 123, 604—605).—Hyperglycemia lasting an hr. or longer was observed.

H. G. R.

**Effect of intravenous injections of suspensions of solids on blood-sugar.** A. LUMIERE and P. MEYER (Compt. rend. Soc. Biol., 1936, 123, 606—608).—The extent of the hyperglycemia observed depends on the physical nature of the particles.

H. G. R.

**Blood-sugar content of arterial and venous blood.** A. KNAPP (Biochem. Z., 1936, 287, 342—344).—In oxen and hens, the arterial blood-sugar is always > the venous level, the mean differences being 0.0085 and 0.017%, respectively.

P. W. C.

**Colorimetric copper determination of blood-glucose.** E. LASAUSSE, R. KERMADEC, and I. FROCHAIN (J. Pharm. Chim., 1936, [viii], 24, 461—466).—Blood (0.2 c.c.) is deproteinised with  $\text{H}_2\text{WO}_4$  (Folin), reduced by a large excess of Fehling's solution, and the pptd.  $\text{Cu}_2\text{O}$  is dissolved in  $\text{HNO}_3\text{-HCl}$ , Cu being determined colorimetrically by Na dithiocarbamate (cf. A., 1936, 536).

F. O. H.

**Micro-determination of blood-sugar by ceric sulphate titration.** G. GIRAGOSSINTZ, C. DAVIDSON, and P. L. KIRK (*Mikrochem.*, 1936, 21, 21—34).—The deproteinised blood is heated at 100° with aq.  $K_3Fe(CN)_6$  and  $Na_2CO_3$ , acidified with  $H_2SO_4$ , and the  $K_3Fe(CN)_6$  produced is titrated with  $Ce(SO_4)_2$ . A blank test is carried out simultaneously. Within 1%, 10 equivs. of  $Ce(SO_4)_2 = 1$  mol. of glucose. The results agree with those of other methods.

J. W. S.

**Reciprocal relation between glycaemia and chloraemia.** J. LOISELEUR (*Compt. rend. Soc. Biol.*, 1936, 123, 491—494).

H. G. R.

**Variations in erythrocyte and plasma hydræmia and chloræmia after injection of mercurial diuretics.** J. DECOURT, C. O. GUILLAUMIN, and SAPIN (*Compt. rend. Soc. Biol.*, 1936, 123, 466—468).—The differences are more distinct in the erythrocytes than in the plasma and depend on the diuresis obtained and the presence of œdema.

H. G. R.

**Micro-determination of chloride in blood.** S. LEWINSON (*Bull. Soc. Chim. biol.*, 1936, 18, 1537—1541).—The method depends on pptn. of blood-proteins of 0.1 c.c. blood with  $Zn(OH)_2$  and titration of the  $Cl^-$  in the filtrate with 0.01*N*- $AgNO_3$  using  $K_2CrO_4$ -indigo-carmin as indicator.

P. W. C.

**High blood-urea-nitrogen not due to chronic nephritis.** M. G. WOHL and R. W. BRUST (*J. Lab. Clin. Med.*, 1935, 20, 1170—1179).—High blood-urea is often associated with deficient fluid intake or with conditions involving loss of body-fluids and depletion of blood-electrolytes. The mechanism of N retention in conditions not due to glomerular nephritis is closely related to changes in  $H_2O$  and salt metabolism.

CH. ABS. (p)

**Determination of serum-phosphorus.** N. LUENGO (*Rev. Sanid. Hig. publ.*, 1936, 11, 385—394).—Best results were obtained with a semi-micro- or micro-modification applicable to all P fractions in blood and serum, of the Fiske and Subbarow technique.

NUTR. ABS. (m)

**Micro-determination of phosphatases in blood-plasma and inorganic phosphorus in blood.** E. LUNDSTEEN and E. VERMEHREN (*Compt. rend. Trav. Lab. Carlsberg*, 1936, 21, Ser. Chim., 147—166).—Methods are given for determining the plasma-phosphatase (I) and inorg. P in whole blood, using 50 cu. mm. of blood in each case. (I) is inhibited strongly by barbituric buffers but less so by  $NH_4Cl-NH_3$  buffers. The  $p_H$  optimum depends on the duration of reaction (for 70 hr. 8.65, for 1 hr. >9.65). An alkaline  $p_H$  favours both the enzymic reaction and destruction of (I). The extent of reaction  $\propto$  (I) concn.  $Mg^{++}$  must be added to the substrate to obtain a const. activation independent of the serum concn. Vals. are given for the (I) content of the blood-plasma of healthy individuals. E. A. H. R.

**Effect of hypercoagulating substances on blood-calcium.** M. ALVES (*Compt. rend. Soc. Biol.*, 1936, 123, 613—616).—Total and ultrafilterable Ca is increased by injection of Na citrate or gelatin.

H. G. R.

**Iron. XI. Separation of blood-catalase from "readily eliminated" iron. XII. Hæmoglobin and "readily eliminated" iron in adsorption and cataphoresis.** G. BARKAN and O. SCHALES (*Z. physiol. Chem.*, 1936, 244, 81—88, 257—265; cf. A., 1936, 747).—XI.  $Al_2O_3$  adsorbs the catalase (I) from blood solutions but not the "readily eliminated" Fe (II). Hence no part of this Fe is identical with (I).

XII. When washed hæmolyzed erythrocytes are used instead of blood solutions, the hæmoglobin is separated (by adsorption on  $Al_2O_3$ ) from (II) in one operation. No separation takes place on cataphoresis, by which, however, the non-identity of (II) with (I) is confirmed.

W. McC.

**o-Toluidine reaction in the medico-legal detection of blood.** F. NICOLETTI (*Diag. tec. lab. (Napoli)*, Riv. mens., 1935, 6, 529—536).—The reaction is sufficiently sensitive and sp.

CH. ABS. (e)

**Callicrein of blood.** E. WERLE (*Biochem. Z.*, 1936, 287, 235—261; cf. A., 1934, 224).—Callicrein (I) from blood-serum is not identical with urinary and pancreatic (I), since serum-(I) but not urinary and pancreatic (I) is inactivated by cysteine and glutathione and since the behaviour towards various inactivating substances from organs and fluids is different. Common properties are destruction by powerful oxidising agents (I,  $KMnO_4$ ,  $H_2O_2$ ) and ultra-violet light and high mol. wt. (inability to dialyse). All substances other than (I) which reduce blood-pressure are destroyed by boiling in neutral solution for short periods. (I) is partly purified by adsorption on caseinogen and by fractional pptn. with  $(NH_4)_2SO_4$ .

W. McC.

**Resistance of red cells to hæmolysis in hypotonic solutions of sodium chloride: blood disorders.** G. A. DALAND and K. WORTHLEY (*J. Lab. Clin. Med.*, 1935, 20, 1122—1136).—Max. and min. resistance to hypotonic NaCl is determined in various anæmias and leucæmia.

CH. ABS. (p)

**Calculations for isotonic solutions. Graphical method.** W. NIXON (*Pharm. J.*, 1936, 137, 568—569).—Calculations for isotonic mixtures of two substances of known isotonic equivs. are simplified by the use of graphs. Examples are given.

F. O. H.

**Isotonic solutions for injection.** F. WOKES (*Quart. J. Pharm.*, 1936, 9, 455—459).—The hæmolysing [NaCl] for human blood is approx. 0.40—0.47%. The ratio of isotonic to hæmolysing concn. of substances used (B.P. Codex 1934) for the prep. of isotonic solutions is generally 2—3, an exception being  $H_3BO_3$  which hæmolyses at concns. of 0.5—5.0%.

F. O. H.

**Chemistry of blood coagulation. III. Chemical constituents of blood platelets and their role in blood clotting; activation of clotting by lipins.** E. CHARGAFF, F. W. BANCROFT, and M. STANLEY-BROWN (*J. Biol. Chem.*, 1936, 116, 237—251; cf. A., 1936, 1285).—Platelets from horse blood are separated and fractionally extracted. The lipin fraction contains kephalin (I), lecithin, and sterols. The phos-

phatide fraction contains a potent activator of the clotting of chicken plasma. The (I) fractions from soya beans, cotton-seed, yeast, and muscle extracts contain a similar activator. The defatted blood platelets contain a  $H_2O$ -sol. inhibitor of blood clotting.

F. A. A.

**Action of metals. IV. Influence of metals on blood clotting.** H. HAUSLER and L. VOGEL (Biochem. Z., 1936, 287, 405—410).—Inhibition of blood clotting by metals *in vitro* depends on the partial or complete pptn. of fibrinogen (I). After a single injection of a heavy-metal salt solution into rabbits, a temporary inhibition of blood clotting occurs with simultaneous decrease of blood-(I) content. After injections repeated over a long period, acceleration of clotting occurs accompanied by increased blood-(I) content.

P. W. C.

**Non-essential nature of calcium in the action of thrombin on fibrinogen.** H. WEITNAUER and E. WOHLISCH (Biochem. Z., 1936, 288, 137—144).—Complete removal of Ca from thrombin (I)-fibrinogen systems does not inhibit coagulation. Contrary results by other workers are probably due to alterations in or decomp. of (I).

F. O. H.

**Blood coagulation. II.** H. DYCKERHOFF, W. VON BEHM, N. GOOSSENS, and H. MIEHLER (Biochem. Z., 1936, 288, 271—291; cf. A., 1936, 497).—The coagulation of fresh blood is readily affected by addition of various substances and hence recalcified oxalated plasma is used for comparative measurements. Injection of Nd salts renders the blood uncoagulable *in vivo* for several hr. The inhibition of *in-vitro* coagulation by Nd and heparin is irreversible.

F. O. H.

**Rôle of carbon dioxide in certain properties of blood-serum.** R. O. PRUDHOMME (Ann. Inst. Pasteur, 1936, 57, 545—564).—The observation of Chorine and Koechlin (Compt. rend. Soc. Biol., 1934, 116, 19) that the flocculation of sera of patients suffering from paludism shows diurnal variations has been confirmed. Similar but smaller variations occur in normal sera and in isolated euglobulin solutions, and are due to variations in the  $CO_2$  tension of the solutions, produced by the methods of storage. Change of  $CO_2$  tension by other means produces similar effects; the  $CO_2$  acts by varying the  $pH$ .

F. A. A.

**Clinical immunity.** (Sir) W. WILLCOX (Lancet, 1936, 231, 911—913).—An address.

L. S. T.

**Protoplasmic specificity.** E. E. JUST (Science, 1936, 84, 351—352).

L. S. T.

**Serum-precipitin in anaphylaxis in the rabbit.** C. JACKSON (J. Immunol., 1935, 28, 225—239).—A quant. study.

CH. ABS. (p)

**Anaphylactic shock *in vitro*.** Liberation of an active substance from the isolated lung of a sensitised guinea-pig. G. UNGAR and J. L. PARROT (Compt. rend. Soc. Biol., 1936, 123, 676—678).—The lung, but not the liver, of a sensitised animal gives anaphylactic reactions *in vitro*.

H. G. R.

**Antigenic action of phosphatides: purified kephalin.** A. WADSWORTH, E. MALTANER, and F.

MALTANER (J. Immunol., 1935, 28, 183—191).—Purified kephalin showed no antigenic properties.

CH. ABS. (p)

**Antigenic action of cholesterol.** A. WADSWORTH, E. MALTANER, and F. MALTANER (J. Immunol., 1935, 29, 135—149).—Reactions obtained with cholesterol (I) and sera of rabbits inoculated with mixtures of (I) and swine serum are due to the effect on the complement of the increased anticomplementary properties of these sera, together with fluctuations in the stability of (I) suspensions caused by changes in the amount of protective serum-colloids in dilutions of antisera prepared with physiological saline.

CH. ABS. (p)

(A) Isoantigenic properties of casein. (B) Effect of deamination on antigenic properties of casein. J. H. LEWIS (J. Infect. Dis., 1934, 55, 168—171, 203—206).—(A) The antigenic action of casein (I) from various milks must be similar. Injection into a goat of (I) from its own milk caused the production of antibodies for both goat and cow (I).

(B) Deamination of (I) with  $HNO_3$  does not destroy its antigenic reaction nor prevent its reaction with anti-(I) serum. (I) reacts with antiserum for deaminised (I).

CH. ABS. (p)

**Influence of manganese on antibody formation.** M. DECHGI and L. TORELLI (Boll. sez. Ital., 1936, 8, 50—52).—Traces of  $MnCl_2$  injected into rabbit blood increase the agglutinating and lytic power of serum, but large doses cause a transitory diminution owing to a partial pptn. of blood-protein interrupting the normal rate of antibody formation. Repeated injections of small doses of  $MnCl_2$  increase the content of the agglutinating antibody.

W. R. D.

**Relative importance of reticulo-endothelial tissues and circulating antibody in immunity.**

**II. Hypersensitiveness and immunity to foreign proteins.** F. H. TEALE (J. Immunol., 1935, 28, 161—182).—Immunity to foreign proteins depends on the capacity of the tissues to deal with the proteins: the circulating antibody, even if it could saturate the inoculated antigen before being taken up by the tissues, is probably unable to aid the work of the tissues in dealing with the inoculated dose.

CH. ABS. (p)

**Relation of allergy to the antibody content in animals vaccinated with B.C.G.** B. J. CLAWSON and A. B. BAKER (J. Infect. Dis., 1935, 56, 297—300).—No definite proportion or necessary relation exists between bacterial allergy and antibodies in the blood.

CH. ABS. (p)

**Immunochemical system, sheep blood-anti-sheep blood serum.** E. BRUNIUS (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 10, 1—3).—Highly purified Forssman antigen is resistant to proteolytic enzymes,  $HNO_2$ , and  $PhNCO$  but largely loses its immunological character when treated with  $CH_2N_2$ . Proteolytic enzymes completely destroy the activity of the antibody, which is also destroyed by  $HNO_2$  and  $PhNCO$ .

E. A. H. R.

**Influence of aminophenylstibinates on the toxin-antitoxin complex.** H. GOLDIE (Compt.

rend. Soc. Biol., 1936, 123, 768—770).—The toxin or the complex is adsorbed by the stibinate and pptd. H. G. R.

**Apparent and real titres of antitoxic sera.** M. WEINBERG and M. GUILLAUMIE (Compt. rend. Soc. Biol., 1936, 123, 661—664).—Variations in the titre can be reduced by using a toxin prepared from a single cell culture. H. G. R.

(A) **Nature of the antibodies for sheep-cells in infectious mononucleosis.** C. A. STUART, A. M. GRIFFIN, M. FULTON, and E. G. E. ANDERSON. (B) **Thermostable antigen in ox cells.** C. A. STUART, A. M. GRIFFIN, K. M. WHEELER, and S. BATTEY (Proc. Soc. Exp. Biol. Med., 1936, 34, 209—212, 212—215).—(A) Sheep-cell antibodies in infectious mononucleosis are not Forssman antibodies. (B) The antigen of ox and sheep cells which adsorbs the antibodies of infectious nucleosis is thermostable and insol. in and resistant to EtOH. It is therefore neither an isophile fraction nor a Forssman heterophile antigen. The type-sp. antigens  $K_1$  and  $K_2$  in rabbits are probably of a similar type. A. G. P.

**Precipitinogenic action of human plasma and its constituents.** L. HEKTOEN and W. H. WELKER (J. Infect. Dis., 1934, 55, 271—275).—Intramuscular injection of human plasma or serum, especially when adsorbed on  $Al(OH)_3$ , causes a production of sp. precipitins which may be continued for months. CH. ABS. (p)

**Ultramicro-technique for precipitation and agglutination reactions.** C. L. HUDSON and S. MUDD (J. Immunol., 1935, 28, 311—320). CH. ABS. (p)

**Non-identity of jack-bean agglutinin with crystalline urease.** J. B. SUMNER and S. F. HOWELL (J. Immunol., 1935, 29, 133—134).—The cryst. urease has no agglutinating action on washed rabbit erythrocytes (cf. Hotchkiss and Tauber, A., 1932, 531). CH. ABS. (p)

**Extraction of labile bacterial antigen by disruption of the bacterial cells at low temperature.** E. J. CZARNETZKY (Science, 1936, 84, 355—356).—Disruption at liquid air temp. is described. L. S. T.

**Use of gelatin in rapid test preparations of *Bacterium abortus* antigen.** Variation in the effect of gelatin on agglutination titres of bovine sera. C. R. DONHAM and C. P. FITCH (J. Infect. Dis., 1935, 56, 203—209).—Gelatin in antigen preps. increases their sensitivity for some but not all sera. CH. ABS. (p)

**Concentration and purification of antimeningococcus serum.** P. P. MURDICK and S. M. COHEN (J. Immunol., 1935, 28, 205—208). CH. ABS. (p)

**Ultracentrifugal concentration of pneumococcal antibodies.** R. W. G. WYCKOFF (Science, 1936, 84, 291—293).—Type I antibody is associated with a mol. having a sedimentation const.  $16 \times 10^{-13}$  cm. per sec. per dyne. L. S. T.

**Antigenic characteristics in man of certain products of the pneumococcus: comparison with vaccine.** L. D. FELTON, W. D. SUTLIFF, and

B. F. STEELE (J. Infect. Dis., 1935, 56, 101—110).—Certain fractions produce a protective antibody in man, the response being comparable with that obtained by vaccine. Fractions made by autoclaving at 17 lb. for 15 min. are inactive. CH. ABS. (p)

**Hæmolysin and antihæmolysin of tetanus toxin.** E. LEMETAYER (Compt. rend. Soc. Biol., 1936, 123, 742—745).—Tetanospasmin and tetanus toxin are neuro-toxins and the presence of the hæmolysin is not related to that of the poison. H. G. R.

**Neutralisation of the tetanus toxin hæmolysin by normal sera.** E. LEMETAYER (Compt. rend. Soc. Biol., 1936, 123, 745—747).—The antihæmolysin found in normal sera is not due to natural immunisation by tetanus antigen. H. G. R.

**Flocculating and immunising properties of antitoxins purified by precipitation with trichloroacetic acid.** G. RAMON, A. BOIVIN, and R. RICHOU (Compt. rend., 1936, 203, 634—636; cf. A., 1936, 1423).—The antitoxin (I) of diphtheria or staphylococcus, pptd. with  $CCl_3 \cdot CO_2H$ , is dissolved in a little  $PO_4'''$  buffer at  $p_H$  8, and brought to the same concn. as the original (I) with Ringer's solution or a culture broth. The tendency of either prep. to flocculate is the same as that of (I). All three exhibit the same antigenic characteristics *in vitro*, but *in vivo* (guinea-pig or rabbit) the immunising action of the ppt. diluted with Ringer's fluid is  $>$ , and that diluted with broth  $<$ , that of (I). J. L. D.

**Production of diphtheria antitoxins from toxins prepared with Pope and Llewellyn-Smith's medium.** I. FJORD-NIELSEN (Compt. rend. Soc. Biol., 1936, 123, 725—729).—Immunisation with toxins prepared with the medium give a strong reaction and a low production of antitoxin, both of which can be improved by ultrafiltration. H. G. R.

**Precipitation of diphtheria toxin by organic compounds of antimony.** H. GOLDIE (Compt. rend. Soc. Biol., 1936, 123, 648—651).—Diphtheria toxin can be pptd. by aminophenylstibinates at  $p_H$  4, the latter being removed by  $1:4:6:8-NH_2 \cdot C_{10}H_4(SO_3Na)_3$ . H. G. R.

**Concentration and purification of toxins and toxoids by ultrafiltration.** F. MODERN and G. RUFF (Compt. rend. Soc. Biol., 1936, 123, 69—70).—Using the technique of Quigley (A., 1934, 1326), a ten-fold concn. is obtained without appreciable loss. H. G. R.

**Polarimetry, refractometry, and protein content of immunised [anti-diphtheria] horse sera.** F. MODERN and G. RUFF (Compt. rend. Soc. Biol., 1936, 123, 501).—Parallel variations, not  $\propto$  the antitoxic power, were observed. H. G. R.

**Isolation of immunologically pure antibody.** B. F. CHOW and H. WU (Science, 1936, 84, 316).—The antibody isolated by the process described is a protein. L. S. T.

**Physiology of the kidneys.** T. GAYDA (Boll. Soc. ital. Biol. sperim., 1936, 11, 475—527).—A lecture. F. O. H.

**Effect of age on the phosphorus compounds of the brain.** S. E. EPELBAUM, B. I. CHAIKINA, and E. B. SKVIRSKA (Ukrain. Biochem. J., 1936, 9, 613—636).—A higher content of total P and acid-sol. P is found in the brains of very young rabbits (7—30 days) than in those of adult rabbits. The amount of adenosinephosphoric acid and other readily hydrolysable P compounds is small compared with the amount in muscle. F. A. A.

**Iodine in poultry.** R. SASAKI (J. Agric. Chem. Soc. Japan, 1936, 12, 1069—1076).—The amount of I in the eggs and organs of white Leghorn hens and cocks fed a basal ration alternately with the same ration containing KI varied from organ to organ, the thyroid gland being the least affected. J. N. A.

**Presence and distribution of aluminium in animal tissues.** P. MEUNIER (Compt. rend., 1936, 203, 891—894).—Al was found in the muscles and organs of the herbivorous mammals and marine animals examined. The pancreas and the intestinal mucus have the highest Al content (5—30 mg. per kg.) in the cow and horse. In general, the Al content rises in descending the animal scale, but is only 1—2% of that of plants. F. A. A.

**Water, calcium, and potassium content of the grey and white matter of the brain in experimental tetany.** C. I. PARHON and M. CAHANE (Compt. rend. Soc. Biol., 1936, 123, 831—833).—Little variation in the H<sub>2</sub>O content and a decrease in Ca and K were observed. H. G. R.

**Contents of calcium and total solids in the bile of cadavers.** W. JELINGHOFF (Arch. exp. Path. Pharm., 1936, 183, 310—318).—In the hepatic bile the Ca content (0.024—0.072%) varied with the period of time which had elapsed since food had been consumed. In the gall-bladder bile the Ca content at first decreased but later increased to a max. of approx. 0.12% as the concn. of solids in the bile increased. W. McC.

**Distribution of nickel in organs of lamelli-branch molluscs.** R. PAULAIS (Compt. rend., 1936, 203, 685—687; cf. A., 1925, i, 719).—Ni was determined in five species by a modification of Rollet's method (A., 1926, 930). The branchiæ and hepatopancreas contained most Ni, whilst muscle contained the least. *Cardium edule* contained much more Ni than the other species. J. N. A.

**Chemical composition of bone in d'Albers-Schonberg disease.** K. V. BEBESCHIN (Ukrain. Biochem. J., 1936, 9, 511—519).—In this disease, the bones contain less H<sub>2</sub>O than, and 2½ times as much ash as, normal bones. The content of org. substances, Ca, Mg, and P remains almost unchanged, collagen is reduced to half, and the fat content is insignificant, compared with normal bones. F. A. A.

**Mineral metabolism of dental tissue.** V. V. KOVALSKI. **Mineral structure of dental tissue of the guinea-pig.** V. V. KOVALSKI, O. M. GLEZINA, V. BARANSKI, G. KOGAN, R. RUTBERG, and N. TSCHITSCHKINA (Ukrain. Biochem. J., 1936, 9, 637—654).—Na, K, Ca, and Mg are differently distributed between the functionally different teeth (molars and

incisors) of the guinea-pig. Differences also exist between teeth from the upper and lower jaws, and right and left sides. F. A. A.

**Physico-chemical properties of nervous tissue. II. Electrical conductivity, viscosity, and  $\rho_H$ .** S. V. FOMIN and D. M. STRASHESKO (Ukrain. Biochem. J., 1936, 9, 897—915).—The differences observed in the properties of extracts of various parts of the nervous system (cerebrum, cerebellum, spinal cord, ischiadic nerve, grey and white matter from cerebral hemispheres) depend largely on their content of mineral substances. F. A. A.

**Comparative biochemistry of muscle. III. Phosphagen in molluscs and crustacea.** G. BAGDASARJANTZ (Ukrain. Biochem. J., 1936, 9, 573—581).—The muscles of three species of molluscs examined, whose habitats are sea-H<sub>2</sub>O, fresh H<sub>2</sub>O, and land, respectively, and of crabs and certain lower crustacea, contain argininephosphoric acid (0.015—0.059%) and free arginine. Creatine and creatinephosphoric acid are absent. F. A. A.

**Free and protein-bound glycogen in liver.** H. BIERRY, B. GOUZON, and C. MAGNAN (Compt. rend. Soc. Biol., 1936, 123, 762—764). H. G. R.

**Molecular structure of glycogen from the whole tissues of *Mytilus edulis*.** D. J. BELL (Biochem. J., 1936, 30, 2144—2145).—The earlier conclusion (A., 1936, 1403) that glycogen of *M. edulis* contains 18 glucose units per mol. instead of the normal 12 units is confirmed by the results of acetylation and methylation. Hydrolysis of the methylated glycogen gave 1 mol. of 2:3:4:6-tetramethylglucose, 15 mols. of 2:3:6-trimethylglucose, and 2 mols. of dimethylglucoses. P. W. C.

**Structure of animal and plant cellulose. II. Investigation by X-rays.** F. MAY and R. STUHLER (Z. Biol., 1936, 97, 454—458; cf. A., 1936, 1011).—Tunicin (animal cellulose, prepared from *Phallusia mamillata*) has a cryst. structure and gives an X-ray pattern identical with that of plant cellulose (starch-free filter-paper, cotton) (cf. Herzog, A., 1926, 563). F. O. H.

**Distribution of lipins in fresh ox skin.** R. M. KOPPENHOEFFER (J. Biol. Chem., 1936, 116, 321—341).—The lipins of the corium consist of two groups, complex lipins and sterols, and triglycerides, the former being associated with the physiological activity of the skin. Increased saturation, OH-acid formation, and liberation of free fatty acid occur at the skin surface, and hydroxycholesterol is present in the epidermal layer of which the waxy constituent is characteristic. P. G. M.

**Excitation of the fluorescence of cholesterol and of skin.** F. VLES and A. UGO (Compt. rend. Soc. Biol., 1936, 123, 226—231).—The spectra of cholesterol (I) and some cholesteryl esters have been examined: that of skin is due to proteins and fatty acids in addition to (I). H. G. R.

**Biochemistry of the sterol group. I. Sterols, bile acids, and neutral saponins. II. Cardiac poisons and vitamin-D. III. Sex hormone group.** A. BUTENANDT (Chem. and Ind., 1936, 753—759, 891—895, 990—998).—Lectures.

**Floridin activation of cholesterol.**—See A., II, 16.

**Amino-acids of silkworms.** C. HAYASHI (J. Chem. Soc. Japan, 1935, 56, 946—951).—The N distribution of the silk gland and of the gland-free worms is recorded. CH. ABS. (p)

**Difference between reactions with nitroprusside of reduced glutathione, cysteine, acetone, and creatinine: role of  $p_H$ .** P. D. ZIMMET and J. P. PERRENOUD (Bull. Soc. Chim. biol., 1936, 18, 1704—1709).—Glutathione gives a transitory rose colour increasing from  $p_H$  7.8 to 10 (limit of sensitivity 1 in 20,000). Cysteine gives a similar tint, the  $p_H$  optima being 12 and 13 (limit 1 in 50,000). Creatinine has  $p_H$  optima 12 (after 15 min.) and 13 (after 20 sec.) (limit 1 in 5000).  $\text{COMe}_2$  (10%) reacts slowly at  $p_H$  10 and 0.1% at  $p_H$  13. P. W. C.

**Choline and acetylcholine in invertebrates. Organs of *Helix pomatia*.** C. MENTZER, A. KASWIN, E. CORTEGGIANI, and J. GAUTRELET (Compt. rend. Soc. Biol., 1936, 123, 668—670).—The acetylcholine content of the ganglia is high, traces only being found in the hepato-pancreas. Choline is present in the former but was not detected in the latter. H. G. R.

**Liberation of acetylcholine from a complex in the nervous centres by heat.** E. CORTEGGIANI, J. GAUTRELET, A. KASWIN, and C. MENTZER (Compt. rend. Soc. Biol., 1936, 123, 667—668).—The acetylcholine content of the brain is increased by approx. 300% by heating to 70°. H. G. R.

**Liberation of acetylcholine from the liver by enzymes.** J. GAUTRELET, E. CORTEGGIANI, A. KASWIN, and C. MENTZER (Compt. rend. Soc. Biol., 1936, 123, 664—666).—Choline and acetylcholine (or a similar substance) are liberated from guinea-pig's liver by enzymic action. H. G. R.

**Refractive index of proteins.** P. PUTZEYS and J. BROSTEAUX (Bull. Soc. Chim. biol., 1936, 18, 1681—1703).—The sp. increment is not a measure of  $n$  of dissolved protein.  $n$  cannot be calc. accurately from the Gladstone-Dale equation but is given by that of Lorenz and Lorentz. A const. relationship exists, however, between  $n$  calc. by these two methods. The  $n$  of amandin and of haemocyanin of *Helix pomatia* are determined for 4 wave-lengths. The dispersion obeys Cauchy's rule. The  $n$  of ovalbumin, serum-albumin and -globulin, haemoglobin, and edestin are recalcd. using the Lorenz-Lorentz equation. All the simple proteins have  $n_D$  1.600. P. W. C.

**Composition of bonito-meat (*Katsuwonus pelamis*, L.); properties of proteins.** K. KONDO, T. MIHARA (J. Agric. Chem. Soc. Japan, 1936, 12, 1088—1098).—46—47% of the body of the fish is edible, and the flesh consists of  $\text{H}_2\text{O}$  approx. 70% and protein 23%. The latter consists of approx. 25% of  $\text{H}_2\text{O}$ -sol. and 50% of dil. alkali-sol. protein. This last-named contains more  $(\text{NH}_2)_2$ -acids (especially histidine) than the  $\text{H}_2\text{O}$ -sol. fraction. The isoelectric points of the proteins have been determined. J. N. A.

**Composition of meat of the flat fish (*Pseudorhombus cinnamomeus*, T. and S.).** K. KONDO,

K. FUJIOKA, S. SHINANO, and H. MITSUDA (J. Agric. Chem. Soc. Japan, 1936, 12, 1099—1105).—51—53% of the body of Ganzo-Hirame is edible, and the fish consists of  $\text{H}_2\text{O}$  (71—80%), protein (approx. 20%), fat (0.6—5.07%), and ash (approx. 1.2%). The protein content varies inversely with that of  $\text{H}_2\text{O}$  and fat. No sexual difference could be found in the proteins except in the amount of lysine. J. N. A.

**Sensitivity to  $\gamma$ -rays of proteins and their constituent compounds.** H. HIRSCHER (Biochem. Z., 1936, 288, 110—115).—The replacement of normal edestin (I) in the diet of rats by (I) which has been exposed to  $\gamma$ -irradiation from meso-Th results in a diminution in total N excretion and urinary N, C, and "vacate".  $\text{O}_2$ . The effect is due to certain definite  $\text{NH}_2$ -acid constituents of (I), all  $\text{NH}_2$ -acids not being equally sensitive to  $\gamma$ -rays (cf. Olbrich, A., 1936, 632). F. O. H.

**Poisonous substance of the larvæ of *Dendrolinus undans*, Walk., var. *excellens*, Butler.** S. MIYACHI (Folia Pharmacol. Japon., 1935, 20, 177—180).—Two poisons, a globulin and an albumin, are isolated, and their effects are examined. CH. ABS. (p)

**Chemical nature of a hæmatopoietic substance occurring in liver.** H. D. DAKIN, C. C. UNGLEY, and R. WEST (J. Biol. Chem., 1936, 115, 771—791; cf. A., 1935, 885).—Further purification of the active principle (I), leading to preps. of about twice the former potency, is described. These are free from glucosamine; otherwise the fission products (indicating a peptide) are similar to those of earlier preps. Ultrafiltration data suggest a mol. wt. of 2000—5000. (I) is not hydrolysed by depepsinised gastric juice whilst the action of rennin does not produce plastein. (I) is not obtained from kidney, brain, or salivary gland tissues by the process used, and differs from the preps. described by other workers. F. A. A.

**Pernicious anæmia principle in liver. III. Isolation and properties of a substance with primary therapeutic activity.** Y. SUBBAROW, B. M. JACOBSON, and V. PROCHOWNICK (J. Amer. Chem. Soc., 1936, 58, 2234—2236).—Details are given for the isolation of an active substance [as *sulphate* (I), decomp.  $>290^\circ$ ,  $[\alpha]_D^{25} -85.4 \pm 2^\circ$  in  $\text{H}_2\text{O}$ ] from the purine-free liver extract in a yield of 2 mg. per 100 g. of fresh liver. Aq. solutions of (I) show intense blue fluorescence in ultra-violet light; the absorption spectrum has an inflexion between 248 and 256 m $\mu$ . H. B.

**Identification of a compound isolated from scallop mussel.** E. MOORE and D. W. WILSON (Amer. J. Med. Sci., 1935, 190, 143—144).—A substance,  $\text{C}_9\text{H}_{18}\text{O}_4\text{N}_4$ , is isolated from the adductor of the deep-sea mussel. Two  $\text{CO}_2\text{H}$  groups may be present and the compound contains an asymmetric C; reactions indicate a mono-substituted guanidine grouping. CH. ABS. (r)

**Presence and significance of a chromotropic substance in the walls of veins.** F. FEDELI and B. ROSSI (Arch. Ist. Biochim. Ital., 1936, 8, 299—316).—Differential stains indicate the presence of a chromotropic substance in the veins of normal animals and men which increases when the veins are

diseased. The origin and nature of the substance are discussed.

F. O. H.

**Cytochromes. III. Hæmatins of animal and vegetable tissues and cytochrome-*a*.** J. ROCHE and M. T. BÉNÉVENT (Bull. Soc. Chim. biol., 1936, 18, 1650—1673).—The absorption spectra of reduced cytochrome (I) from animal, vegetable, and micro-organism tissues although possessing bands characteristic of (I) are frequently incomplete and an attempt is made to identify the hæmatin (II) constituting the prosthetic group of the (I) from the varying sources. A (II) isolated from horse heart gives a  $C_5H_5N$ -hæmochromogen (III) having two bands, and is convertible into a second (II) which gives a single-banded (III). The two hæmatins correspond each to a constituent of (I)-*a*. By oxidation of proto-(II) in  $C_5H_5N$ , a third (II) is obtained which gives a similar (III) spectrum. The three hæmatins like the (III) of (I) show a strong absorption at 580—590  $m\mu$  and are grouped as hæmatins-*a*. The spectrophotometric behaviour of the (III) of these hæmatins and of chlorocruoro-(II), green (II), and of  $C_5H_5N$  extracts of animal, vegetable, and micro-organism tissues is investigated and the various absorption curves are given (cf. A., 1936, 247).

P. W. C.

**Regeneration of visual purple in solution.** S. HECHT, A. M. CHASE, S. SHLAER, and C. HAIG (Science, 1936, 84, 331—333).—Kühne's original observation that after being bleached by light a solution of visual purple regenerates some of its colour in the dark has been confirmed. The kinetics of the regeneration, which is confined to a narrow  $pH$  range, approx. 6.6—8.0, has been measured. The absorption spectrum of the regenerated visual purple is reproduced.

L. S. T.

**Chemical identity of certain basic constituents present in the secretions of various species of toads.** H. JENSEN and K. K. CHEN (J. Biol. Chem., 1936, 116, 87—91).—Direct comparison of various derivatives shows that bufotenidine (Wieland *et al.*, A., 1934, 1232) is present in *ch'an su* and in secretions of *Bufo bufo gargarizans*, *B. fowleri*, and *B. formosus*, and bufotenine is present in *B. vulgaris*, and *B. viridis viridis*. The basic constituent  $C_{12}H_{14}ON_2$  (1 NMe, no OMe), darkens 200°, m.p. 240° (decomp.) (acetate, decomp. 210°, m.p. 215°; hydriodide, darkens 220°, m.p. 238°), isolated from *B. marinus* and *B. arenarum* is identical with the substance obtained by hydrolysis of bufothionine (Wieland *et al.*, A., 1930, 1466) with 2*N*-HCl.

J. W. B.

**Bee poison.** I. G. HAHN and H. OSTERMAYER (Ber., 1936, 69, [B], 2407—2419).—The initial mixture of bee sting, poison bladder, and exuded poison is completely extracted by three treatments with cold dil.  $HCO_2H$  whereas much more protracted treatment is required with  $H_2O$ . Considerable amounts of the poison are extracted by dil.  $NH_3$ , partly owing to its solubility in  $H_2O$ , partly owing to a chemical change accompanied by the separation of a very sparingly sol. cryst. compound (I) (P 25.39, N 9.66%) in which C and H are present in such small amount that they possibly arise from occluded org. matter. Hot dil.  $HCO_2H$  destroys the neurotoxic components

without affecting the other properties. The crude poison (II) thus obtained cannot be enriched by adsorption and only with great losses by fractional pptn. When absolutely dry it loses only physiologically inactive material to abs. EtOH, after which 90% and 80% EtOH dissolve only inactive components. 60% EtOH dissolves the poison in amount about one half of (II). Subsequently 50%, 40%, and 30% EtOH remove only minimal amounts of inactive material, leaving a physiologically inert residue. Repetition of the extractions with the residue left from the extraction with 60% EtOH gives an almost colourless, non-hygroscopic powder of high physiological activity which gives a clear solution in  $H_2O$ , stable when boiled. On treatment with  $NH_3$  it affords (I). With increasing degree of purity the % N, S, and P increases. The poison diffuses rapidly through membranes. The most active products appear to be closely allied to the proteins in their reactions. They are destroyed by proteolytic enzymes. Hydrolysis with mineral acids destroys all but the hæmolytic action.

H. W.

**Analogy between bee and snake (*Crotalus*) poisons.** C. TETSCH and K. WOLFF (Biochem. Z., 1936, 288, 126—136).—Bee poison and the venom from *C. terrificus* yield protein toxins of similar composition (N 13.6, 14.7; S 2.6, 3.6%, respectively), toxicity in mice, and action on the isolated guinea-pig's intestine.

F. O. H.

**Wool fat.**—See B., 1936, 1214.

**Higher saturated fatty acids of butter fat.** G. E. HELZ and A. W. BOSWORTH (J. Biol. Chem., 1936, 116, 203—208).—The higher-boiling fractions of the Me esters of the acids from butter fat yield hexacosanoic (cerotic) acid.

F. A. A.

**Flavins of milk.** C. T. ROLAND (J. Chem. Educ., 1936, 13, 481—482).—A summary.

L. S. T.

**Biological properties of lactalbumin.** K. TEICHERT (Pharm. Ztg., 1936, 81, 1320—1321).—The biological val., precipitin reactions, and the uses of lactalbumin in bacteriological media are discussed.

W. L. D.

**Oxidase reaction of human milk.** O. S. ROUGHCHITCH and E. DUMITRESCU (Arch. Dis. Childhood, 1936, 11, 61—64).—The reaction became intense from the 3rd to the 6th month and then gradually grew less until the end of lactation. There was no definite relationship between intensity of reaction and milk yield or the time at which the milk was drawn. In five cases of mastitis the reaction of the milk was similar to that obtained with colostrum. At the beginning of menstrual flow the reaction was very intense.

NUTR. ABS. (m)

**Determination of tyramine in cerebrospinal fluid and blood serum.** P. MULLER (Compt. rend. Soc. Biol., 1936, 123, 128—130).—Tyramine is produced in cerebrospinal fluid and serum by hyper-tensive substances.

H. G. R.

**Human mucins.** D. A. BIRJUKOV (Ukrain. Biochem. J., 1936, 9, 521—529).— $\eta$  of human saliva is influenced by reflex reactions (e.g., as a result of drinking  $H_2O$ ). The mucins of human sperm and gastric mucus are unstable.

F. A. A.

**Variations in bile-sugar in hyperglycæmia.** G. BALTAŢEANU, C. VASILIU, and T. BUDEANU (Compt. rend. Soc. Biol., 1936, 123, 843—846).—Both free and protein-bound sugar are increased in the bile. H. G. R.

**Loss of bilirubin introduced into the intestine.** M. ROYER (Compt. rend. Soc. Biol., 1936, 123, 75—76).—After 2—4 hr., the bilirubin diminishes by 39—75%. H. G. R.

**Variations in blood- and bile-bilirubin of intestinal origin.** M. ROYER (Compt. rend. Soc. Biol., 1936, 123, 76—78).—After introduction of bilirubin into the intestines, that of the bile and the high mesenteric veins is considerably increased. H. G. R.

**Reciprocal influence of urobilin and bilirubin of the blood on their biliary elimination.** M. ROYER and A. SPERONI (Compt. rend. Soc. Biol., 1936, 123, 78—80).—Injection of bilirubin (I) causes a considerable increase of (I) in the bile together with an increase in urobilin (II), whilst injection of (II) shows a large increase in (II) with a smaller increase in (I). H. G. R.

**Bile acids of alligator tortoises.**—See A., II, 20.

**Relation between the rate of flow of the bile and the urine during starvation.** G. BALTAŢEANU and C. VASILIU (Compt. rend. Soc. Biol., 1936, 123, 846—848).—The secretions of bile and urine decrease rapidly and remain parallel during the period of starvation. H. G. R.

**Dissociation of the functional properties of the gastric glands under the influence of fat.** A. ALLEY, D. W. MACKENZIE, jun., and D. R. WEBSTER (Amer. J. Digest. Dis. Nutrition, 1934, 1, 333—336).—Fat affects gastric secretion in two phases, one inhibitory and one excitatory. Fat inhibits the nervous phase of secretion, but in large amounts depresses the chemical phase and the secretory effect of histamine. In its inhibitory phase fat diminishes the vol., acidity, and peptic power of the secretion; in the excitatory phase secretion provoked by a stimulant is increased, acidity is slightly and peptic power greatly lowered. CH. ABS. (p)

**Fine structure of phosphate urinary stones.** E. SZOLD (Orvosi Het., 1935, 79, 776, 778).—Stones contained irregular groups of very fine crystals (secondary deposits), differing from the primary urate stones. CH. ABS. (p)

**Normal urinary fluorine excretion. Problem of mottled enamel.** W. F. MACHLE (Dent. Cosmos, 1936, 78, 612—615).—For 101 normal subjects with a wide geographical distribution, and 38 hospital patients, urinary F was 0.5—2.8 mg. per litre (range in 54 cases 0.9—1.09 mg.). Excretion of F is thus a normal occurrence. Drinking H<sub>2</sub>O containing >1—2 mg. of F per litre appears regularly to cause mottled enamel, but amounts in excess of these vals. may be excreted by normal individuals. Food appears to be a more important source of F than H<sub>2</sub>O alone. F intake and absorption are best

measured by determination of urinary and total F excretion. NUTR. ABS. (m)

**Preservation of urine containing phenylpyruvic acid.** M. RHEIN and R. STOEGER (Compt. rend. Soc. Biol., 1936, 123, 807—808).—CHCl<sub>3</sub> is added and the *p<sub>H</sub>* adjusted to 4 with dil. HCl. H. G. R.

**Value of Hanke and Koessler's method for determination of glyoxaline in urine.** P. LELU (Bull. Soc. Chim. biol., 1936, 18, 1636—1649).—The errors arising in applying the method (A., 1920, ii, 67) to urine are critically investigated. The vals. obtained are not exact but are useful as an approximation. P. W. C.

**Determination of cystine in urine.** M. X. SULLIVAN and W. C. HESS (J. Biol. Chem., 1936, 116, 221—232).—In urine, the original Sullivan procedure must be modified by reduction with alkaline CN', washing the sediment produced, and using more naphthaquinone. Normal urines contain about 0.01% of free cystine; an additional 0.0025% is liberated from complexes on keeping, and further amounts are obtained by acid or alkaline treatment, and by hydrolysis. Homocystine does not interfere with the determination, and interference by ascorbic acid is prevented by the use of alkaline CN'. F. A. A.

**Concentration of a hyperglycæmic factor from urine.** B. HARROW, A. MAZUR, I. M. CHAMBLIN, and A. LESUK (Proc. Soc. Exp. Biol. Med., 1936, 34, 688—690).—The active principle is adsorbed on BzOH, which is then removed with EtOH. It is further purified by dialysis, treatment with Ba(OAc)<sub>2</sub> to remove SO<sub>4</sub><sup>2-</sup>, and pptn. with EtOH. The activity is 83 units per g. P. G. M.

**Control of the hepatic function: test for galactosuria.** V. I. BALANESCO and S. OBERIU (Compt. rend. Soc. Biol., 1936, 123, 850—852).—Following ingestion of >0.5 g. of galactose per kg. body-wt., galactosuria is detected by an increase in the reducing power of the urine in cases of hepatic dysfunction. H. G. R.

**Thormahlen's reaction in melanotic urine.** R. ZEYNEK and H. WAELSCH (Z. physiol. Chem., 1936, 244, 159—166; cf. J. Tierchem., 1887, 17, 445).—The substance responsible for the colour reaction is dialysable, relatively stable to alkali, and very unstable to acids. It combines with NH<sub>3</sub> and amines. Attempts to isolate it by adsorption, pptn., and otherwise have not succeeded. W. McC.

**Electrically charged groups in normal and abnormal conditions.** R. KELLER (Arch. exp. Path. Pharm., 1936, 183, 509—524).—During asphyxiation, hunger, fever, menstruation, pregnancy, acute illness, etc., liver and muscles lose sugar, K<sup>+</sup>, PO<sub>4</sub><sup>3-</sup>, and urea to, and gain Na<sup>+</sup> from, the serum; considerable potential changes thus result. Addison's disease is characterised by disturbance of the electronegative potential of serum and connective tissue and decline of the positive potential of storage tissues. In eclampsia and inflammatory diseases similar potential changes occur. The sedimentation rate of red blood cells is greatly accelerated in these diseases. P. W. C.

**Effects of desiccated hog stomach in achlorhydria.** L. SCHIFF and T. TAHL (Amer. J. Digest Dis. Nutrition, 1934, 1, 543—548).—Oral administration of single doses of ventriculin stimulates HCl secretion in amounts which may be > those produced by injection of histamine. Symptomatology associated with achlorhydria is due to lack of an unknown substance which occurs in hog stomach.

CH. ABS. (p)

**Change of carbohydrate metabolism in allergic states and under histamine reactions.** A. DZSINICH and M. PÉLY (Orvosi Het., 1935, 79, 839—842).—Blood-sugar increased in attacks of asthma, anaphylactic shock, and histamine reactions.

CH. ABS. (p)

**Cerebrospinal fluid in tobacco-alcohol amblyopia.** F. D. CARROLL (Amer. J. Ophthalmol., 1935, 18, 720—723).—The total protein in the fluid was > normal.

CH. ABS. (p)

**Toxic amblyopia due to tobacco and alcohol.** F. C. CORDES and D. O. HARRINGTON (Arch. Ophthalmol., 1935, 13, 435—444).—Vasodilator drugs ( $\text{NaNO}_2$  and erythritol tetranitrate) corr. the toxic amblyopias.

CH. ABS. (p)

**Bovine anaplasmosis: chemotherapy.** B. S. PARKIN (Onderstepoort J. Vet. Sci., 1935, 4, 269—280).—Promising results were obtained by injection of "Mercurochrome-220 sol." (dibromohydroxymercurifluorescein).

CH. ABS. (p)

**Ætiologic relation of amidopyrine to agranulocytosis.** F. STENN (J. Lab. Clin. Med., 1935, 20, 1150—1152).—Prolonged oral administration of amidopyrine to guinea-pigs, rabbits, and monkeys caused no appreciable granulocytopenia even in cases of experimental anaemia or bone-marrow injury.

CH. ABS. (p)

**Amidopyrine, barbitol, phenylhydrazine, and benzene in relation to agranulocytic angina.** V. L. BOLTON (J. Lab. Clin. Med., 1935, 20, 1199—1203).—Oral administration of large doses of amidopyrine (I) or of  $\text{C}_6\text{H}_6$ , Na barbitol (II), or of (I) with (II) caused no change in the granulocytic ratio. Administration of  $\text{NHPh}\cdot\text{NH}_2$  caused leucocytosis with anaemia.

CH. ABS. (p)

**Hypochromic anaemia in gastrectomised dogs.** Effect of beef, iron, and liver extract on blood-haemoglobin. S. R. METHER, F. KELLOGG, and K. PURVIANCE (Proc. Soc. Exp. Biol. Med., 1936, 33, 499—501).—In normal dogs receiving a standard bread ration daily, haemoglobin (I) production was increased from 0.86 g. to 2.26 g. per 100 c.c. of blood by addition of beef to the ration. Gastrectomy reduced (I) production to 0.4 g. and to 0.21 g. when beef was added to the ration. In gastrectomised dogs bled frequently to maintain the (I) production at 6—9 g. per 100 c.c. administration of beef predigested *in vitro* with HCl and pepsin and of liver extract sp. for pernicious anaemia did not increase (I) production but it was very greatly increased by giving  $\text{Fe NH}_4$  citrate.

W. McC.

**Early anaemia of premature infants: haemoglobin level of immature babies in the first half-year, and the effect during the first three months**

**of blood injections and iron therapy.** H. M. M. MACKAY (Arch. Dis. Childhood, 1935, 10, 195—203).—In infants of low birth wt. the haemoglobin (I) level at birth was > that of heavier infants but fell to a slightly lower level from 8 to 22 weeks of age. Neither injections of citrated blood nor oral administration of  $\text{Fe NH}_4$  citrate affected the decline in the (I) level during the first 2—3 months.

CH. ABS. (p)

**Effect of iron and copper therapy on haemoglobin content of blood of infants.** C. A. ELVEHJEM, A. SIEMERS, and D. R. MENDENHALL (Amer. J. Dis. Child., 1935, 50, 28—35; cf. A., 1934, 200).—Daily administration of  $\text{Fe pyrophosphate}$  and  $\text{CuSO}_4$  increased the haemoglobin content of the blood of normal infants and those with severe nutritional anaemia.

CH. ABS. (p)

**Anæmic factor of goat's milk.** R. TSCHESCHE and H. J. WOLF (Z. physiol. Chem., 1936, 244, I—III).—Uropterin (Koschara, A., 1936, 882) in daily doses of 0.001 mg. cures the anaemia produced in rats by a diet of goat's milk. The anaemia is prevented by small daily doses of  $\text{Fe}$  (0.01 mg.) and  $\text{Cu}$ .

W. McC.

**Response of guinea-pig reticulocytes to substances effective in pernicious anaemia.** (A) Biological assay of the therapeutic potency of liver extracts. (B) Assay, on guinea-pigs, of haematopoietic activity of human livers; normal and pernicious anaemia. B. M. JACOBSON (J. Clin. Invest., 1935, 14, 665—677, 679—681).—(A) Ability to induce reticulocytosis is confined to materials effective in pernicious anaemia. The guinea-pig test is a valid indicator of the therapeutic activity of liver preps.

(B) Data are recorded.

CH. ABS. (p)

**Modified pigeon method for the bioassay of anti-pernicious anaemia liver extracts.** G. E. WAKERLIN, H. D. BRUNER, and J. M. KINSMAN (J. Pharm. Exp. Ther., 1936, 58, 1—13).—96—99.5% of the erythrocytes of the normal pigeon contain reticular material, an increase in the degree of reticulation due to active preps. being observed by a staining method involving the use of wet mounts.

H. G. R.

(A) Copper and iron content of tissues and organs in nutritional anaemia. (B) Copper content of blood in nutritional anaemia. M. O. SCHULTZE, C. A. ELVEHJEM, and E. B. HART (J. Biol. Chem., 1936, 116, 93—106, 107—118).—(A) Restriction of the dietary  $\text{Cu}$  of rats depletes the body- $\text{Cu}$  to very low vals.; retention of  $\text{Cu}$  fed with  $\text{Fe}$  at this stage is only 5%, although haematopoietic activity is maximal. Young pigs contain larger stores of  $\text{Cu}$ , but show anaemia due to deprivation of  $\text{Fe}$ , which responds to  $\text{Fe}$  treatment. In pigs deprived of both  $\text{Fe}$  and  $\text{Cu}$ , neither haemoglobin nor erythrocytes are formed.  $\text{Cu}$  does not accumulate in the bone-marrow, even when haematopoiesis is rapid following  $\text{Fe} + \text{Cu}$  feeding of anæmic animals.

(B) In pigs suffering from nutritional anaemia due to  $\text{Fe} + \text{Cu}$  deficiency, the blood- $\text{Cu}$  falls to very low levels ( $7.8 \times 10^{-6}\%$ ). Feeding  $\text{Fe} + 2$ —4 mg. of  $\text{Cu}$  daily rapidly increases the blood- $\text{Cu}$ ; smaller amounts of  $\text{Cu}$  produce only small effects, the min.

Cu content for continued hæmatopoiesis being about  $20 \times 10^{-6}\%$ . F. A. A.

**Maximum renewal of blood-hæmoglobin.** G. FONTES and L. THIVOLLE (Compt. rend. Soc. Biol., 1936, 123, 804—806).—Anti-anæmic tablets (Fe, Cu, and hæmatopoietic  $\text{NH}_2$ -acids) were more effective than calves' liver. H. G. R.

**Alteration in serum-bilirubin and bromosulphalein retention in relation to morphological changes in liver and bile passages in cats with total biliary stasis.** A. CANTAROW and H. L. STEWART (Amer. J. Path., 1935, 11, 561—581).—No relation between serum-bilirubin (I) and morphological changes was apparent. Individual variation in bromosulphalein retention was  $>$  that in bilirubinæmia and was unrelated to the duration of stasis, to (I), or to morphological changes in bile or liver ducts. CH. ABS. (p)

**Gall-bladder bile in pregnancy at term and in calculous and non-calculous cholecystitis. White bile.** C. KIEGEL, I. S. RAYDIN, C. G. JOHNSTON, and P. J. MORRISON (Amer. J. Med. Sci., 1935, 189, 881—882).—In all cases the concns. of  $\text{Ca}^{++}$  and bile salts were  $<$  and of  $\text{Cl}^-$   $>$  normal. Cholesterol vals. were high in pregnancy and cholecystitis and low in hydrops. CH. ABS. (p)

**Clinical significance of urobilinuria.** E. SESTU (Arch. Ist. Biochim. Ital., 1936, 8, 317—336).—Data of urinary and faecal urobilin (I) and stercobilin (II) in men with neoplasm of the bile-duct and in dogs with biliary obstruction are discussed with reference to the tissue origin of (I). A high content of (I) may occur even when (II) is absent. F. O. H.

**Nutrition and cancer.** H. AULER (Ernahrung, 1936, 1, 150—167).—A crit. review. A. G. P.

**Carcinogenic agent and organic disposition in the ætiology of tumours.** E. M. FRAENKEL (Acta Cancrologica, 1935, 1, 365—378).—A review. CH. ABS. (p)

**Disturbance of lipin metabolism in patients with malignant tumours.** R. INDOVINA and S. FIANDACA (Acta Cancrologica, 1935, 1, 399—422).—Increased acidity in  $\text{Et}_2\text{O}$  extracts of sera of patients with tumour, diabetes, liver and kidney diseases is due to an increase in unsaturated and weakly bound aliphatic acids. The I val. of the extract is  $>$  normal, or in other pathological conditions. CH. ABS. (p)

**Glycolysis activator from normal and tumour tissues.** W. M. RUBEL and W. A. BELTZER (Acta Cancrologica, 1935, 1, 317—322).—The glycolytic activity of liver tissue is unaffected by extracts of normal or tumour tissues or by  $\text{EtOH}$ -insol. material from these. It is increased by  $\text{EtOH}$ -insol. matter from an aq.  $\text{NH}_3$  extract of the dried  $\text{COMe}_2$ -insol. powder prepared by Kraut and Bumm (A., 1928, 1274). CH. ABS. (p)

**Action of carotene on glycolysis of blood in cancer and in normal persons.** C. WETZLER-LIGETI and R. WILLHEIM (Acta Cancrologica, 1935, 1, 289—300; cf. A., 1934, 1259).—The action of carotene (I) in accelerating glycolysis in normal blood is centred in the erythrocytes. Removal of

co-enzymes from cells by washing eliminates the action of (I) which is restored by addition of yeast or muscle extracts. Washed cells treated with tumour extracts behave like cells from cancer sera and are not affected by (I). Glycolysis of normal cells is inhibited by dihydroxycarotene. Differences between normal and cancerous blood-cells in this respect are related to differences in oxidation-reduction potential. CH. ABS. (p)

**Effect of heavy colloidal metals on growth of transplanted tumours and their radiosensitivity.** T. KIKUCHI (Japan. J. Obstet. Gynecol., 1935, 18, 88—104).—Injection of colloidal Bi and Pb inhibited the growth of rabbit sarcoma. Intratumoral administration slightly decreased tissue respiration and glycolysis. Intravenous injection accelerated tissue respiration. Accumulation of the metals was in the order liver  $>$  kidney  $>$  spleen. CH. ABS. (p)

**Value of lead compounds in treatment of malignant tumours.** M. DATNOW *et al.* (Amer. J. Cancer, 1935, 24, 531—548).—The prep. is described of various Pb compounds containing  $-\text{NH}_2$  and a complex ion formed by reaction with  $\text{Na}_2\text{S}_2\text{O}_3$ . Pharmacological properties are compared. CH. ABS. (p)

**Influence of diets containing proteins of various fishes on the growth of tumour in rats.** II, III. S. TOKUYAMA and W. NAKAHARA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1936, 30, 200—215, 216—225; cf. A., 1936, 1406).—II. With proteins from skipper, *Sawara*, and hickory-shad tumour growth was as rapid as with horse-meat protein. Most other fish proteins caused slower growth. There was no relation between influence on tumour growth and classification of the fishes. III. Fish proteins which produce good nutrition of the rat before implanting the tumour generally induce good body development and rapid tumour growth afterwards. A no. of exceptions to this rule are noted. J. N. A.

**Treatment of tumours by hydrogen iontophoresis.** N. OKUNEV (Acta Cancrologica, 1935, 1, 357—364).— $\text{H}^+$  passing between electrodes through mice tumours penetrated to a depth of 1.5 cm. and retarded tumour growth. CH. ABS. (p)

**Experimental production of sarcoma with thorotrast.** F. R. SELBIE (Lancet, 1936, 231, 847—848).—The carcinogenic action of thorotrast, a colloidal solution of  $\text{ThO}_2$ , is confirmed. L. S. T.

**Influence of caloric intake on growth of sarcoma 180.** F. BISCHOFF, M. L. LONG, and L. C. MAXWELL (Amer. J. Cancer, 1935, 24, 549—553).—A reduction of 50% in the caloric intake retarded tumour growth although loss in body-wt. was only slightly  $<$  that caused by a 33% reduction in intake. CH. ABS. (p)

**Potential determinations in tumour tissue.** R. BIERICH and A. LANG (Biochem. Z., 1936, 287, 411—417).— $E_H$  vals. are tabulated for various rat and human tumour tissues. The intact cancer cell does not possess a lower reduction intensity than does the normal cell. P. W. C.

**Susceptibility of rats to dental caries.** T. ROSEBURY, M. KARSHAN, and G. FOLEY (J. Amer. Dental Assoc., 1935, 22, 98—113).—Factors in the aetiology of caries include forcible impaction of fermentable food particles into the fissures of the molars and an abnormal relation in the Ca-P-vitamin-D complex. CH. ABS. (p)

**Possible relation between ammonia in saliva and dental caries.** J. WHITE and R. W. BUNTING (J. Amer. Dental Assoc., 1935, 22, 468—473).—No relation was observed. CH. ABS. (p)

**Saliva and enamel decalcification.** J. T. GORE (Dental Cosmos, 1935, 77, 942—950).—The complex carbohydrate segment in the mucin plaque is hydrolysed to a reducing sugar which yields lactic acid on bacterial fermentation. Saliva tends to neutralise the acid. CH. ABS. (p)

**Cholesterol content of cataractous human lenses.** W. SALIT and C. S. O'BRIEN (Arch. Ophthalmol., 1935, 13, 227—237).—The cholesterol content increases with age but is not affected by cataracts. CH. ABS. (p)

**Local quinine therapy in interstitial keratitis and old corneal capacities.** E. SELINGER (Arch. Ophthalmol., 1935, 13, 829—832). CH. ABS. (p)

**Blood-creatinine in dementia præcox.** G. CARDINALE (Minerva med., 1935, II, 208—209).—Vals. were within low normal limits. CH. ABS. (p)

**Blood-sugar determinations in certain cases of diabetes.** E. P. GRIFFITHS and L. C. SHRADER (Pennsylvania Med. J., 1935, 38, 699—704).—In some diabetics high morning blood-sugar (I) and glycosuria occurred regardless of diet or insulin (II) intake. Frequent feeding with simultaneous administration of (II) maintained normal (I). CH. ABS. (p)

**Effect of experimental diabetes on the cornea of dogs; relation to administration of vitamin-A.** E. P. RALLI, E. B. GRESSER, and G. FLAUM (Arch. Ophthalmol., 1935, 14, 253—262).—Vitamin-A is not the only factor concerned in ocular symptoms in depancreatised dogs. CH. ABS. (p)

**Phloridzin diabetes in man. II. Influence of phloridzin on the capillary and venous glycaemic curve during fasting and after ingestion of glucose.** S. BATTISTINI and L. HERLITZKA (Minerva med., 1935, II, 199—202).—Injection of phloridzin into diabetics decreased and intensified the difference between glycaemia of capillary and venous blood after fasting and after glucose-tolerance test. CH. ABS. (p)

**Changes in blood-amino-acids due to ingestion of glucose by normal and diabetic men.** E. SLAVICH and A. TORRINI (Boll. Soc. ital. Biol. sperim., 1936, 11, 669—671).—Fasting for 12 hr. followed by ingestion of 75 g. of glucose decreased the  $\text{NH}_2$ -acid-N level of the blood by an average of 1.97 mg. (per 100 c.c.) in 10 normal men and 1.62 mg. in 14 out of 20 diabetics; the remaining 6 showed an increase (more transitory) of 1.82 mg. F. O. H.

**Diabetes mellitus. I. Toxicity of ketones. II. Toxicity of hyperglycaemia.** N. HAMANAKA (Mitt. med. Akad. Kioto, 1936, 17, 349—352).—The C (A., III.)

$\text{O}_2$  uptake of rats' tissues in solutions containing  $\beta$ -hydroxybutyric acid,  $\text{COMe}_2$ , or high proportions of glucose indicates that the lowered resistance of diabetics is not due to increase of blood-ketones or of the sugar content of blood and tissue-fluids.

NUTR. ABS. (m)

**Diastase therapy in diabetes mellitus.** W. DEICHMANN-GRUBLER and V. C. MYERS (Biochem. Z., 1936, 288, 149—154).—Intravenous injection of taka-diastase preps. does not affect the blood-sugar of rabbits or guinea-pigs; intraperitoneally it produces hypoglycaemia and death. In normal men, subcutaneous injection diminishes alimentary hyperglycaemia and favourably influences carbohydrate metabolism in diabetics. The effect is probably due to a hypoglycaemic principle and not to the enzyme itself. F. O. H.

**Hæmatological studies in epidemic dropsy.** H. N. CHATTERJEE and M. N. HALDER (Calcutta Med. J., 1935, 30, 1—15).—In cases examined the decrease in hæmoglobin was  $>$  that in total erythrocytes. Administration of Fe increased both factors. Leucocytes increased early in the disease but not later. Mononuclears and eosinophiles decreased with increasing severity of the disease and *vice versa*.

CH. ABS. (p)

**Treatment of amœbic dysentery by entero-vioform.** R. L. RAMIREZ and J. C. GALAN (Rev. Asoc. Med. Argentina, 1935, 49, 764—769).—Use and toxicity of vioform (a colloidal suspension of chloroiodoquinoline) are examined. CH. ABS. (p)

**Blood-lipins in eclampsia.** E. M. BOYD (Amer. J. Obstet. Gynecol., 1935, 30, 323—332).—No significant variations in the lipins of blood, serum, or red or white cells were apparent. A method for determining the plasma-phospholipin:total cholesterol ratio is described. CH. ABS. (p)

**Cause of baker's eczema.** W. FRIEBOES (Ernahrung, 1936, 1, 64—69).—The significance of flour constituents (protein products) and of improvers (notably persulphates) is considered. A. G. P.

**Chronic galactæmia: carbohydrate studies.** H. H. MASON and M. E. TURNER (Amer. J. Dis. Children, 1935, 50, 359—374).—Abnormal sugar metabolism in a case of functional disturbance of the liver is examined. CH. ABS. (p)

**Prophylaxy of goitre as a nutritional problem; validity of the iodine-deficiency theory of the origin of endemic goitre.** F. FISCHLER (Ernahrung, 1936, 1, 119—126).—A review. A. G. P.

**Blood-oxygen in exophthalmic goitre.** E. H. RYNEARSON, B. T. HORTON, and J. DE J. PEMBERTON (West. J. Surg. Obstet. Gynecol., 1934, 42, 476—478).—Thyroid veins in goitre contain much arterial blood, the  $\text{O}_2$  saturation being 90% (thyroid arteries 93%). CH. ABS. (p)

**Use of iodine in recurrent exophthalmic goitre.** S. F. HAINES (West. J. Surg. Obstet. Gynecol., 1934, 42, 449—455).—In many cases I therapy lowered the basal metabolic rate. When I treatment gave easy control, there was little or no regeneration of thyroid tissue after operation. CH. ABS. (p)

**Iodine for brood mares.** B. W. RODENWOLD and B. T. SIMMS (Amer. Soc. Animal Prod. Rec. Proc. 27th Ann. Meet., 1934, 89—92).—Goitrous conditions in foals and calves were prevented by feeding KI to mares and cows during the latter half of the gestation period. CH. ABS. (p)

**Blood-iodine in thyroid disease.** G. M. CURTIS, V. V. COLE, and F. J. PHILLIPS (West. J. Surg. Obstet. Gynecol., 1934, 42, 435—448).—Lack of correlation between blood-I and basal metabolic rate is demonstrated. Patients with other than thyroid disease show normal blood-I unless receiving I medication. CH. ABS. (p)

**Thyroid and parathyroid diseases.** F. H. LAHEY (J. Med. Soc. New Jersey, 1935, 32, 479—482).—Goitre patients showed gastric acidity averaging +46. Hyperthyroidism does not produce hyperacidity. A micro-method for determining I is described. Disappearance of intravenously injected I is rapid in exophthalmic goitre. Blood-cholesterol (I) decreases in hyperthyroidism and increases in myxœdema and is a better index of thyroid disturbance than is the basal metabolic rate. (I) decreases during thyroid medication. CH. ABS. (p)

**Insulin-glucose therapy in heart disease.** E. S. NICHOL (Amer. J. Digest. Dis. Nutrition, 1935, 2, 236—241).—Insulin (I) [in addition to glucose (II) and  $O_2$ ] is necessary for the work of the heart muscle. (I) increases the ability of the muscle to utilise (II). This action is differentiated from the effect of (I)-hypoglycæmia on the circulation. CH. ABS. (p)

**Chemical treatment of hydatid disease.** L. E. BARNETT (Austral. New Zealand J. Surg., 1935, 4, 211—218).—The efficiency of various drugs, of serum, and of X-irradiation is compared. CH. ABS. (p)

**Creatine content of hypertrophied rabbit's heart.** G. DECHERD, E. H. SCHWAB, G. HERRMANN, and W. O. BROWN (Proc. Soc. Exp. Biol. Med., 1936, 33, 521—522).—The creatine content tended to decrease as the degree of experimental hypertrophy increased. W. McC.

**Content of ascorbic acid in adrenals of guinea-pigs with experimental oxalate-phosphate hypocalcæmia.** G. DOMINI (Boll. Soc. ital. Biol. speriment., 1936, 11, 677—680).—The total ascorbic acid content is approx. 50% of the normal val., the diminution being mainly due to that of the reduced form. F. O. H.

**Application of a quinine-calcium gluconate preparation in influenza.** G. OBITZ (Orvosi Het., 1935, 79, 780—781). CH. ABS. (p)

**Role of serum-calcium fractions in the effect of viosterol on the bleeding tendency in jaundice.** J. S. GRAY and I. C. IVY (Amer. J. Digest. Dis. Nutrition, 1935, 2, 368—372).—The action of viosterol in restoring the normal bleeding time is not related to any changes in the total or ultrafilterable serum-Ca. CH. ABS. (p)

**Treatment of leprosy with oils obtained from salt- and fresh-water fishes.** O. CALCAGNO (Semana med., 1935, II, 557—562).—A review. CH. ABS. (p)

**Blood-cholesterol after administration of oil and cholesterol in health and disease.** W. FROHLING (Arch. Verdauungs-Krankh., 1936, 59, 205—219).—The free and total cholesterol (I) of the plasma of healthy subjects on diets deficient in fat and sterol increased during the day by 20—25% of the fasting val. and high vals. were obtained only by administration of very large amounts of (I) and then only irregularly. The presence, rather than the absence, of alimentary hypercholesterolemia should be regarded as a pathological symptom in liver cirrhosis. NUTR. ABS. (m)

**Basal metabolism and specific dynamic action of proteins in liver disease.** J. ANDREU URRA and J. LOZANO (Rev. espan. Enferm. Aparat. digest. Nutric., 1936, 2, 323—329).—The basal metabolism was increased, and the sp. dynamic action of proteins decreased, in 75% of cases suffering from parenchymatous disease of the liver. These facts support the theory that deamination of  $NH_2$ -acids in the liver is the real cause of the sp. dynamic action of proteins. NUTR. ABS. (m)

**Quinine in malaria.** B. C. BHATTACHARJI (Indian Med. Rec., 1934, 54, 193—195).—Compound quinine-strychnine-digitalis preps are described. CH. ABS. (p)

**Treatment of myopathies with amino-acids.** B. C. ROY and D. W. CHATTERJEE (Calcutta Med. J., 1935, 30, 32—35).—Administration of glycine (I) causes a sharp increase in urinary creatinine and a secondary decrease in creatine. Use of (I) with ephedrine and  $NaH_2PO_4$  gave better results than (I) alone. CH. ABS. (p)

**Renal insufficiency produced by partial nephrectomy.** V. Diets containing whole dried meat. VI. Relation between kidney function, kidney weight, and surface area in intact and unilaterally nephrectomised rats fed whole dried meat diets. A. CHANUTIN and S. LUDEWIG. VII. Relationship of urine-urea, blood-urea, and urea (Addis) ratio in rats on whole dried meat diets. S. LUDEWIG, E. T. R. WILLIAMS, and A. CHANUTIN. VIII. Comparison of the urea (Addis) ratio with results of other tests of renal function. A. CHANUTIN and S. LUDEWIG (Arch. Int. Med., 1936, 58, 60—80, 81—88, 89—94, 95—101).—V. As the meat content of the diet was increased hypertension was accentuated, an increased vol. of dil. urine was excreted, and pathological changes, together with increased wt., in the kidney remnant occurred.

VI. Kidney wt.  $\propto$  surface area and the ratio urea (I) ratio : kidney wt. is a const. The ratio (I) ratio : surface area increases with the meat content of the diet, being  $\propto$  the renal hypertrophy.

VII. The (I) concn. in the blood and urine at the same (I) ratio increases with the protein intake.

VIII. The (I) concn. in the blood after ingestion of (I) and the sp. gr. of urine are good tests for renal damage. The correlation between the vol. of urine (but not the protein content) and renal damage was good. H. G. R.

**Lipin metabolism during experimental uranum nephritis.** M. POLITZER (Arch. Farm. speriment., 1936, 62, 70—76).—Nephritis induced by  $UO_2(OAc)_2$

in rabbits is accompanied by increased levels of free fatty acid, neutral fats, and, to a smaller extent, cholesterol, phosphatides, total fatty acids, and cholesteryl ester in the blood. F. O. H.

**Storage of cystine in the reticulo-endothelial system and its association with chronic nephritis and renal rickets.** D. S. RUSSELL and H. J. BARRIE (*Lancet*, 1936, 231, 899—905).—Two cases of storage are described, as well as a third in which cystinuria and chronic nephritis were unaccompanied by cystine storage in the tissues. L. S. T.

**Influence of viosterol and parathyroid extract on mineral metabolism in osteogenesis imperfecta.** A. E. HANSEN (*Amer. J. Dis. Children*, 1935, 50, 132—157).—Deficiency in retention of Ca, P, and Mg was observed in osteogenesis imperfecta. Large doses of viosterol induced a negative balance in most minerals and an increased urinary output of Ca and P with a decrease in faeces. Parathyroid caused an excessive output of Ca, P, Mg, K, and Na, chiefly in urine. Phosphatase activity of blood was lowered by both treatments. CH. ABS. (p)

**Mineral metabolism in a case of osteopsathyrosis and one of ununited fracture.** T. B. COOLEY, G. C. PENBERTHY, L. ARMSTRONG, H. A. HUNSCHER, F. COPE, and I. G. MACY (*Amer. J. Dis. Children*, 1935, 50, 431—442).—Retentions of N, P, Ca, Mg, Na, K, and S are recorded. In both cases an initial period of extreme loss of Cl<sup>-</sup> was followed by one of slight retention. CH. ABS. (p)

**Plasma-chlorides in pneumonia: their clinical significance.** A. F. FOWLER (*Canad. Med. Assoc. J.*, 1935, 33, 482—485). CH. ABS. (p)

**Polypeptidæmia during normal gestation.** ESTIENNY, JEAN, and JALIBERT (*Compt. rend. Soc. Biol.*, 1936, 123, 462—463). H. G. R.

**Reaction for diagnosis of pregnancy.** R. A. FERRARI and D. J. FRANCIS (*Semana med.*, 1935, II, 555—556).—The Kapeller-Adler test (colour reaction of histidine in urine) is valueless. CH. ABS. (p)

**Pregnancy test: presence of histidine in urine of pregnant women.** (A) H. RENTON. (B) L. P. BOSMAN (*S. African Med. J.*, 1935, 9, 441—443, 514).—(A) A modification of the Kapeller-Adler test is described.

(B) Polemical. Histidine is not a regular constituent of urines in early pregnancy.

CH. ABS. (p)

**Mechanism of rheumatic fever.** A. F. COBURN (*Lancet*, 1936, 231, 1025—1030).—Serological developments following hæmolytic streptococcus pharyngitis are recorded. In the rheumatic subject development of the antibody response appears to be delayed. L. S. T.

**Rickets in rats. XV. Effect of low-calcium-high phosphorus diets at various levels and ratios on production of rickets and tetany.** A. T. SHOAL [with S. B. WOLBACH] (*J. Nutrition*, 1936, 11, 275—291; cf. A., 1932, 1280).—Rickets may be produced, in the absence of vitamin-D, by high-Ca-low-P, low-Ca-high-P, and low-Ca-low-P diets. With the last-named the Ca/P ratio may be

within limits usually recognised as normal. For any given ratio an increase in the abs. amounts fed may convert a rachitogenic into a non-rachitogenic diet. A. G. P.

**Blood-sodium in essential hypertonus and Simmond's disease.** E. KYLIN and H. ELMQUIST (*Acta med. scand.*, 1936, 88, 507—516).—In 25 normal individuals serum-Na ranged from 316 to 377 mg. per 100 ml. (mean val. 348 mg.). In 10 cases of Simmond's disease the range was 305—357 mg., and in 27 cases of essential hyperpiesis 348—425 mg. The raised Na level in essential hyperpiesis is ascribed to over-function of the pituitary-adrenal "unit," whereas in Simmond's disease hypofunction causes lowered serum-Na level. NUTR. ABS. (m)

**Snake bites and their treatment in India.** R. N. CHOPRA and J. S. CHOWHAN (*Calcutta Med. J.*, 1935, 29, 459—485).—Prep. and use of antivenins and use of various chemicals are described.

CH. ABS. (p)

**Specific substance of syphilitic fluids.** A. VERNES (*Compt. rend.*, 1936, 203, 684—685).—Serum and cerebrospinal fluid from syphilitics contain pallidin, which can be determined photometrically. By the action of C<sub>2</sub>Cl<sub>4</sub> on syphilitic serum a ppt. is obtained, which when extracted with COMe<sub>2</sub>, Et<sub>2</sub>O, or H<sub>2</sub>O gives a substance which causes a normal serum to act as a syphilitic serum. J. N. A.

**"Dynarsan Egger," a new agent against syphilis.** N. GERENCSÉR (*Orvosi Het.*, 1935, 79, 853—854).—The prep. (aq. solution of *m*-acetamidop-hydroxyphenylarsinic acid derivatives) can be used in cases in which arsenobenzene must be avoided.

CH. ABS. (p)

**Relation of some iodine-binding substances (glutathione, ascorbic acid) to the carbohydrate economy in trypanosome infection. Intermediary regulation of metabolism.** G. SCHEFF and Z. CSILLAG (*Arch. exp. Path. Pharm.*, 1936, 183, 467—477).—In trypanosome infection of guinea-pigs, the glutathione (I) and ascorbic acid (II) contents of the liver and blood vary, but the total I-binding substances are const. Reduced (I) and (II) are greatly decreased and oxidised (I) is increased. The behaviour of (I) is due to the deficiency of carbohydrate, and the consequent disturbance of oxidation-reduction potential. P. W. C.

**Intravenous administration of styrylquinoline [No. 314] in equine trypanosomiasis.** B. S. PARKIN (*Onderstepoort J. Vet. Sci.*, 1935, 4, 287—288). CH. ABS. (p)

**Aluminium hydroxide in treatment of peptic ulcer.** I. H. EINSEL, W. L. ADAMS, and V. C. MYERS (*Amer. J. Digest. Dis. Nutrition*, 1934, 1, 513—516).—Colloidal Al(OH)<sub>3</sub> (I) controls peptic ulcers. It lowers free acidity in the stomach, which returns to normal when treatment is discontinued. Unlike NaHCO<sub>3</sub>, (I) does not increase HCl output after the primary action. (I) probably stimulates secretion of mucin. No disturbance of the acid-base balance in blood follows (I) therapy.

CH. ABS. (p)

"Okirin" as an adjuvant in the treatment of peptic ulcer. A. J. ATKINSON (Amer. J. Digest. Dis. Nutrition, 1934, 1, 713—714).—Beneficial effects of okirin (dried mucilaginous material from pods of the okra plant) are recorded. CH. ABS. (p)

Metabolic activity of renal tissue. G. QUAGLIARIELLO (Boll. Soc. ital. Biol. sperim., 1936, 11, 608—627).—A lecture. F. O. H.

Determination of the basal metabolism in the rat. J. M. JOLY (Compt. rend. Soc. Biol., 1936, 123, 658—660).—The coeff.  $K$  in Meeh's formula decreases to a min. with increasing age of the rat and finally returns to the initial val. in the adult. H. G. R.

Differential reduction of Janus-green during development of the chick. O. RULON (Proto-plasma, 1935, 24, 346—364). M. A. B.

Influence of the respiratory process on absorption and potential-formation of frog's skin. E. HUF (Biochem. Z., 1936, 288, 116—122).—The  $O_2$  consumption of isolated frog's skin is the same (30—100 cu. mm. per g. per hr. at  $20^\circ$ ) in air or  $O_2$  and is increased by injury and decreased by 0.001M-KCN. Presence of 0.005M-glucose or up to 0.01M-lactate or -pyruvate increases the  $O_2$  consumption of normal skin but only the last two increase that of the skin of  $CH_2Br\cdot CO_2H$ -poisoned frogs. F. O. H.

Respiratory quotient of spermatozoa. E. E. IVANOV (Bull. Soc. Chim. biol., 1936, 18, 1613—1622).—The R.Q. of sheep's spermatozoa in absence of glucose is 0.78 and in presence of glucose approximates to 1. Oxidation of lactate does not play any important role in the preservation of respiration in synthetic media. P. W. C.

Energy and gaseous metabolism of normal and deutectomised chicks between ten and a hundred hours of age. H. G. BAROTT, T. C. BYERLY, and E. M. PRINGLE (J. Nutrition, 1936, 11, 191—210).—Calorimetric determinations of metabolic rates at a range of environmental temp. from  $20^\circ$  to  $40^\circ$  are recorded. A crit. temp. occurs at  $35.5^\circ$ , above and below which metabolism increases 15% for a  $7^\circ$  change. From  $35.5^\circ$  to  $21.1^\circ$  metabolism increases steadily. Vals. for the sexes were not significantly different. The g.-hr. rate for normal chicks is const. at a given temp. within the physiological range for the age studied. For deutectomised chicks the g.-hr. rate decreases continuously and in direct proportion to time after operation. A. G. R.

Gas metabolism of white rats fed gelatin, tyrosine, and tryptophan. M. SHIMASAKI (Folia Endocrinol. Japon., 1934, 10, 79—80).—A protein-free diet supplemented with gelatin (I) or with (I) + tyrosine decreased body-wt. and lowered (rapidly at first)  $O_2$  consumption and  $CO_2$  production.  $O_2$  consumption per kg. body-wt. was lowered at first but later became  $\leq$  normal. With a similar diet supplemented with (I) + tryptophan, body-wt. was unchanged and gaseous exchange decreased at first but later became normal. In all cases the R.Q. was normal. CH. ABS. (p)

Gas metabolism of white rats fed fungus growths. M. SHIMASAKI (Folia Endocrinol. Japon., 1934, 10, 80).—Basal metabolism was increased by feeding powdered thyroid and to a smaller extent by fungus and was decreased by KI. The R.Q. was lowered by thyroid, increased by KI, and unchanged by fungus. CH. ABS. (p)

Influence of physical exercise on the metabolism of adolescents. E. S. SAVRON, M. E. KARLSON, and A. S. USCHAKOVA (Ukrain. Biochem. J., 1936, 9, 765—778).—The quantities of metabolic products (total N, creatinine,  $NH_3$ , and P) in the urine of adolescents increase after exercise such as wrestling, but as training proceeds, these increases become less marked. F. A. A.

Effect of work and training on the oxidation-reduction potential of muscle tissue. III. Changes in the potential of the muscles during training and work due to the influence of acid and alkaline diet. R. TSCHAGOVETZ (Ukrain. Biochem. J., 1936, 9, 917—924).—The shapes of the curves showing the decrease in anaerobic oxidation-reduction potential with time of extracts from both control and worked muscles alter with the nature of the diet. F. A. A.

Relation between animal and human nutrition. E. MANGOLD (Ernahrung, 1936, 1, 21—25).—Digestive and metabolic processes are discussed. The applicability of results of experiments with animals to problems of human nutrition is considered. A. G. P.

English diets. I. Men. E. M. WIDDOWSON. II. Women. E. M. WIDDOWSON and R. A. McCANCE (J. Hyg., 1936, 36, 269—292, 293—309).—I. The average kg.-cal. intake of men on freely chosen diets was 3067 (variation, 1772—4955). A definite lowering of cal. intake with increasing age was observed. No correlation existed between cal. intake and body-wt. The proportion of cal. taken from fat was high. The total Ca, P, and Fe intakes were 0.87, 1.61, and 0.0168 g. per day, respectively, 98% of the P and 66% of the Fe being in the available form.

II. The average daily kg.-cal. consumption of women was 2187 (variation, 1453—3110). Thus woman val./man val. is 0.7. The average daily protein intake was 67 g. Fat and carbohydrate contributed equally to the cal. val. The average daily Ca, total and available P intakes were 0.67, 1.32, and 1.09 g., respectively. W. L. D.

Effect of diet, range, and fattening on the physical and chemical composition of cockerels. H. M. HARSHAW (J. Agric. Res., 1936, 53, 357—368).—In most cases the nature of the diet had no influence on the composition of the birds. Effects of fattening on the relative wts. of leg and breast muscle and of other edible portions are examined. The composition of the various portions was unaffected. A. G. P.

Effect of the reaction of fodder on the oxidative processes in horses. M. F. GULI, P. J. RIBAK, and M. A. KOLOMITSCHENKO (Ukrain. Biochem. J., 1936, 9, 535—553).—Determinations of the urinary excretion of PhOH subcutaneously injected into groups

of horses, fed on two rations, one more alkaline than the other, shows that oxidation processes are more complete with the less alkaline diet. The quantity of conjugated PhOH follows the quantity of total PhOH excreted, but is independent of the alkalinity of the diet.

F. A. A.

**Acid- and alkali-forming foods.** J. A. TOBEY (Amer. J. Publ. Health, 1936, 26, 1113—1116).—A review. The nature of the food has no significant effect on the acid-base balance.

E. C. S.

**Influence of acidic and alkaline diets on growing rats.** O. C. COMES (Boll. Soc. ital. Biol. sperim., 1936, 11, 683—686).—Acidic and alkaline diets produce growth < that due to normal diets by approx. 11—13% but nutrition is generally unaffected.

F. O. H.

**Significance and accuracy of biological values of proteins computed from nitrogen metabolism data.** H. H. MITCHELL, W. BURROUGHS, and J. R. BEADLES (J. Nutrition, 1936, 11, 257—274).—Determinations of biological vals. of proteins by the N balance method are subject to an average standard deviation of 3.7. The nutritive equivalence of protein mixtures for maintenance and growth is substantially the same whether evaluated by means of the N balance or by the paired feeding method supplemented by carcass analysis. Vals. for beef and certain nut proteins are determined. The depression of digestibility and biological val. of peanut protein by roasting is small.

A. G. P.

**Protein-minimum and protein-optimum [in nutrition].** K. FELIX (Ernahrung, 1936, 1, 31—35).—A review.

A. G. P.

**Utilisation of protein and the protein content of foods.** C. LAURESCO (Arch. internat. Physiol., 1935, 42, 145—158; Chem. Zentr., 1936, i, 1042—1043).—The coeff. of utilisation of protein (I) by rats increases with the (I) content of the ration up to approx. 20% and declines to a substantially const. level as the proportion of (I) fed is further increased. True coeffs. of utilisation should be expressed not as abs. vals. but as functions of the (I) content of the diet.

A. G. P.

**Relative digestibility of caseins in their artificial and natural environments.** K. BHAGVAT and M. SREENIVASAYA (Current Sci., 1936, 5, 134—135).—Of a no. of milks examined, buffalo milk has the lowest and ass' milk the highest casein (I) dispersion, whilst the albumin content increases with the extent of (I) dispersion. The relative rates of digestion of the (I) from cow's and ass' milk are determined *in vitro*.

F. N. W.

**Rate of protein formation in organs and tissues. I. After caseinogen feeding.** T. ADDIS, L. J. POO, and W. LEW (J. Biol. Chem., 1936, 116, 343—352).—Changes in the protein content of liver and kidney are large after caseinogen feeding, but small in the heart or muscle, each organ or tissue exhibiting characteristic protein formation. Skin- and muscle-protein increase relatively to that of internal organs during fasting.

P. G. M.

**Action on the urinary quotients of mixtures of two plant proteins of different metabolic**

**action.** K. H. LEHMANN (Biochem. Z., 1936, 287, 433—439).—The C:N and "vacate"-O<sub>2</sub>:N urinary quotients of rats were determined on diets containing as a source of protein a mixture of one third oatmeal protein and two thirds wheat-gluten protein and compared with vals. obtained under the same conditions but feeding only oatmeal protein or caseinogen. Lower abs. vals. for C and "vacate"-O<sub>2</sub> were obtained with the mixture, suggesting more complete utilisation.

P. W. C.

**Cereals and rickets. VIII. Intestinal hydrolysis of phytin.** J. T. LOWE and H. STEENBOOK (Biochem. J., 1936, 30, 1991—1995; cf. A., 1936, 1161).—The substantial part of the P of phytin (from wheat bran) available to rats is rendered almost completely non-available by addition of 3% of CaCO<sub>3</sub> to the ration. MgCO<sub>3</sub>, SrCO<sub>3</sub>, BeCO<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, and Fe<sub>2</sub>O<sub>3</sub> act like CaCO<sub>3</sub>. The effect of CaCO<sub>3</sub> is unchanged by substituting whole wheat or rolled oats for yellow maize in the ration and by adding lard or lactose.

W. McC.

**Glucose yield of glycinin.** J. S. GRAY (Proc. Soc. Exp. Biol. Med., 1936, 34, 144—145).—The yield of glucose (I) from the glycinin of soya bean determined by administration to phloridzinised dogs (Janney, A., 1915, i, 475) was 61% whilst that of caseinogen was 42%. The (I) yield of a protein cannot be predicted by calculating the amount of (I) which the component glucogenic NH<sub>2</sub>-acids are capable of producing in the animal organism.

W. McC.

**Influence of carbohydrates, fats, and proteins on the respiratory coefficient and basal metabolism of man at rest and in thermal equilibrium.** R. LECOQ and J. M. JOLY (Compt. rend. Soc. Biol., 1936, 123, 680—682).—Similar changes in the coeff. and basal metabolism was observed when glucose, olive oil, or peptone was ingested.

H. G. R.

**Purine metabolism in the dog. Effect of metabolic condition on the inhibitory action of Indian ink on uricolysis.** F. CHROMETZKA, R. DREYER, and K. DUMLEIN (Arch. exp. Path. Pharm., 1936, 183, 286—293).—In dogs on meat-rich or -free diets, uricolysis is restricted, especially after intravenous injection of Indian ink, by administration of Na<sub>2</sub>CO<sub>3</sub>. When large doses of Na<sub>2</sub>CO<sub>3</sub> are given, intravenously injected uric acid is partly or wholly unoxidised.

W. McC.

**Histological changes in endocrine organs of white rats fed tryptophan.** M. SHIMASAKI (Folia Endocrinol. Japon., 1934, 10, 65—66).—Gelatin diets without tryptophan atrophied the organs.

CH. ABS. (p)

**Relation of leucine, isoleucine, and norleucine to growth.** M. WOMACK and W. C. ROSE (J. Biol. Chem., 1936, 116, 381—391).—By the use of protein-free diets, leucine and isoleucine were shown to be indispensable for the growth of rats. The position of norleucine is uncertain.

P. G. M.

**Formation and disappearance of adenylic acid in muscles.** D. L. FERDMAN and Z. M. OKUN (Ukrain. Biochem. J., 1936, 9, 863—878).—Free

adenylic acid in the muscles of frogs rises from 4% of the total adenine nucleotide to 30.8% as a result of fatigue. This val. returns slowly to normal on resting, together with disappearance of inorg.  $P_2O_7^{4-}$ . F. A. A.

Adenosinetriphosphoric acid exchange in the muscles of hibernating animals. O. FEINSCHMIDT (Ukrain. Biochem. J., 1936, 9, 851—862).—Muscles of hibernating marmots have a lower adenosinetriphosphoric acid (I) content than those of the active animals. The pyrophosphate fraction from active animals contains mainly (I), with very little inorg.  $P_2O_7^{4-}$ , but in hibernation the latter constituent rises to 32—68%, and free adenylic acid (II) reaches 30% of the total adenine nucleotide. On awakening, an  $NH_3$  compound is formed in the muscles by deamination of (II). F. A. A.

Creatine-phosphagen metabolism during ontogenesis in mammals. A. M. RJABINOVSKAJA (Ukrain. Biochem. J., 1936, 9, 761—763). F. A. A.

Creatinuria after ingestion of meat during the exhaustion of carbohydrate supplies in the organism. S. I. VINOKUROV and J. A. TROTZKI (Ukrain. Biochem. J., 1936, 9, 583—591).—Marked creatinuria results when meat is eaten after physical exercise performed under such conditions that the carbohydrate store is exhausted, but does not occur when the store is maintained by previous ingestion of carbohydrate. F. A. A.

Relation between urinary creatinine and total body-creatine, surface area, and body-weight. F. W. KINAIRD, J. C. AULL, jun., and J. VAN DE ERVE (Amer. J. Med. Sci., 1935, 190, 237—241).—In rats the daily urinary creatinine (I) [but not the (I) coeff.] is directly related to the total body-creatine, (II), surface area, and body-wt. The % (II) [but not the % "organic" (II)] is related to the average daily (I) and the (I) coeff. The "organic" body wt. and daily urinary (I) are highly correlated. CH. ABS. (p)

Growth-promoting ability of di-N-methylhomocystine and N-methylmethionine in connexion with a cystine-deficient diet.—Sec A., II, 9.

Nitrogen balance in cattle using urea and "amide flakes" as protein substitutes. E. MANGOLD and H. STOTZ (Landw. Versuchs-Stat., 1936, 127, 97—118).—Replacement of 25% of the N of a normal ration by urea did not alter the N balance of bull calves. A similar replacement by "amide flakes" (urea-potato flakes) increased N retention. A. G. P.

Formation of histamine from histidine by animal tissues. E. WERLE (Biochem. Z., 1936, 288, 292—293).—On shaking rabbit's kidney (but not liver, brain, or spleen) slices in Tyrode's solution containing histidine, histamine is produced especially in absence of O, and in slightly alkaline solution. F. O. H.

Detoxication of phenylacetic acid by the chimpanzee. F. W. BOWER (Proc. Soc. Exp. Biol. Med., 1936, 33, 598—600).—A chimpanzee which

consumed 4 doses of about 160 mg. per kg. of  $CH_2Ph\cdot CO_2H$  (I) exhibited no untoward symptoms and about 80% of the (I) was recovered from the urine as phenylacetylglutamine. The urinary vol. per 24 hr. was reduced by (I). W. McC.

Flavin content of the eggs and embryos of *Selachii* during development. M. FONTAINE and A. GOUREVITCH (Compt. rend. Soc. Biol., 1936, 123, 443—445).—A diminution was observed. H. G. R.

Organic phosphorus compounds. I. Lecithin and phosphorus metabolism. M. CORRAZZA (Arch. Farm. sperim., 1936, 62, 42—52).—Subcutaneous or, to a smaller extent, oral administration of egg-lecithin to rabbits with approx. const. excretion of P diminishes both the urinary and faecal elimination of P. With both treated and untreated rabbits, faecal is > urinary P excretion. F. O. H.

Influence of choline on lipin metabolism. F. CEDRANGOLO and R. CONTE-MAROTTA (Boll. Soc. ital. Biol. sperim., 1936, 11, 657—658).—A fat-rich diet in rats increases the liver-fat (I) and -glycogen (II) levels as compared with rats on a normal diet. Addition of choline to the fat-rich diet results in a comparative decrease in (I) and a much greater increase in (II), indicating conversion of fat into carbohydrate. F. O. H.

Effect of various diets, cholesterol, and choline on the lipins of the rat's liver. A. V. STOEGER I. McQUARRIE, and J. A. ANDERSON (Proc. Soc. Exp. Biol. Med., 1936, 33, 595—597).—The total fatty acid, cholesterol (I), and phospholipin (II) contents of the dried livers of rats on a standard adequate diet for 105 days were 14.34, 1.03, and 12.37%, respectively. These vals. were as follows when the diet was replaced for the same period by diets with: 85% of fat 33.05, 1.45, 16.72%; 80% of carbohydrate 24.32, 1.25, 13.65%; 80% of protein 15—69, 1.16, 33.92%. The vals. were increased by addition of 2.5 and 5.0% of (I) to the standard diet, the (II) content being increased by 50%. Added choline prevented increase due to (I) in the (II) and neutral fat contents but only partly prevented increase in the (I) content. W. McC.

Liberation of iodine from iodised fat in the animal body and its relationship to intermediary fat metabolism. G. SATO (Tôhoku J. Exp. Med., 1936, 28, 503—521).—In rabbits receiving intravenous injections of KI the rate of urinary excretion of I was > that found when iodised fat was given. When fat metabolism was increased by fasting and by administration of thyroxine the rate following iodised fat was = or > that following KI. Hence degradation of the fat and elimination of I from it take place concurrently in the body. The rate of I excretion diminished following extirpation of the thyroid but increased after insulin administration. In rabbits poisoned with P and  $CHCl_3$  the rate was decreased and the I content of the liver greatly increased. Blockade of the reticulo-endothelial system did not affect the rate or result in increased I retention in the liver. NUTR. ABS. (m)

Effect of neutral fat, fatty acids and glycerol on the metabolism of ethyl alcohol. M. NEX-

MARK and E. M. P. WIDMARK (Skand. Arch. Physiol., 1936, **73**, 260—266).—Oleic acid (I) deflected a certain portion of administered EtOH from its usual course of metabolism in the dog, as shown by the reduced EtOH concn. in the blood, but arachis oil was without effect. When glycerol (II) was given together with (I) the effect of (I) in reducing the EtOH concn. was greatly enhanced. (II) alone had no perceptible influence on EtOH metabolism, and did not increase the effect of glycine and citric acid. Glycerophosphoric acid had no effect, and when given with (I) did not increase its activity. NUTR. ABS. (m)

**Utility of hardened fats in human metabolism.** C. MASSATSCH and H. STEUDEL (Deut. med. Woch., 1935, **61**, 1918—1919; Chem. Zentr., 1936, i, 1043).—Utilisation of hardened and of natural fats is similar. The Et<sub>2</sub>O extract, soap, and free fatty acid contents of faeces are the same in both cases, and urinary N is unaffected. A. G. P.

**Ketosis following fat ingestion by obese and non-obese patients.** E. L. KEENEY, J. W. SHERRIL, and E. M. MACKAY (Amer. J. Digest. Dis. Nutrit., 1936, **3**, 231—235).—In man ketonuria usually appeared when the blood-ketone level exceeded 4 mg. per 100 ml. of plasma. Following a meal rich in fat, obese patients usually showed more marked ketonuria than did non-obese patients. NUTR. ABS. (m)

**Inanition and carbohydrate reserves.** H. BIERRY, B. GOUZON, and C. MAGNAN (Compt. rend. Soc. Biol., 1936, **123**, 760—762).—No complete disappearance of glycogen (I) was observed in frogs even after protein starvation. This is not due to a (I) reserve but to a process of synthesis. H. G. P.

**Carbohydrate metabolism of brain. I. Determination of glycogen in nerve tissue.** S. E. KERR. **II. Effect of varying carbohydrate and insulin supply on glycogen, free sugar, and lactic acid in mammalian brain.** S. E. KERR and M. GHANTUS (J. Biol. Chem., 1936, **116**, 1—7; 9—20).—I. A modification of Pflüger's method (A., 1904, ii, 595) for determining glycogen (I) in brain is described. The main points of the method are avoidance of post-mortem changes in tissue, rapid dissolution of the latter with hot KOH-EtOH, separation of cerebroside by hot MeOH-CHCl<sub>3</sub>, and a correction for non-fermentable reducing substances formed during acid hydrolysis. Mammalian brain frozen *in situ* contains 0.07 to 0.13% of (I).

**II.** The cerebra of well fed or fasting dogs contained 0.077—0.15% of (I), those of rabbits 0.07—0.099%. The vals. are not affected by, nor are the amounts of lactic acid and phosphocreatine in brain altered by, fasting, over-feeding, injection of glucose with or without insulin (II), phloridzin poisoning followed by adrenaline, or pancreatectomy. Large doses of (II) caused a marked decrease in brain-(I) of dogs and rabbits. The free sugar of the brain varied from 0.035 to 0.075% in rabbits, and from 0.045 to 0.086% in dogs. Increase or decrease of blood-sugar caused a similar effect in brain sugar. J. N. A.

**(A) Changes in blood-sugar and glycogen content of liver and muscle after administration of**

**monosaccharides. (B) Effect of insulin on the blood-sugar and the glycogen content of liver and muscle. (C) Change in blood-sugar and glycogen content of liver and muscle after administration of disaccharides.** Y. SUNABA (Mitt. med. Akad. Kioto, 1936, **17**, 335—336, 336—337, 338).—(A) Glucose (I), fructose (II), mannose (III), and galactose (IV) caused large increases in blood-sugar, when 4 g. per kg. body-wt. were given orally to rabbits. Liver-glycogen (V) increased considerably in the rabbits given (I); with (II) and (IV) it increased less and with (III) only slightly. Muscle-glycogen (VI) did not increase.

**(B)** Injection of insulin (VII) caused a decrease in blood-sugar. (V) did not decrease as much as in rabbits given no (VII) but the fall in (VI) was greater. With large doses of (VII) (V) decreased more rapidly than in control rabbits. After injection of (VII) into rabbits, given (I) orally, the increase in (V) was < in rabbits given no (VII).

**(C)** Sucrose (VIII) and maltose (IX) given orally increased the blood-sugar and the (V). Lactose (X) caused a smaller increase in blood-sugar and had little effect on (V). (VIII) produced a slight increase in (VI), but (IX) and (X) were without effect. NUTR. ABS. (m)

**Utilisation of sugars of different configuration—glucose, fructose, galactose, sucrose, lactose, maltose, starch, and mannan (ivory nut)—by carnivorous animals.** G. FINGERLING and R. SCHOENEMANN (Landw. Versuchs-Stat., 1936, **127**, 119—122).—Supplementary feeding with glucose, maltose, fructose, or sucrose resulted in the same C balance. Fat production was similar with all sugars but increased when these were replaced by starch. Carbohydrate metabolism is influenced to some extent by the stimulus exerted by the sugars on the digestive process. A. G. P.

**Formation of hexose phosphate esters in frog muscle.** G. T. CORI and C. F. CORI (J. Biol. Chem., 1936, **116**, 119—128).—Data on anaerobic frog muscle and its behaviour when treated with adrenaline and dinitrophenol or caffeine, and when breakdown of hexose diphosphate (I) to lactic acid is inhibited by CH<sub>2</sub>I-CO<sub>2</sub>, indicate that (I) is formed from hexose, using the phosphate groups of adenosine triphosphate (II). (II) is re-formed at the expense of phosphocreatine phosphate, and hexose monophosphate from inorg. phosphate. F. A. A.

**Age of host and cell metabolism in lymphatic leucæmia in the mouse.** J. VICTOR and J. S. POTTER (Proc. Soc. Exp. Biol. Med., 1936, **33**, 609—611).—In mice 6—8 months old glycolysis in transmitted leucæmic cells in presence of glucose is less pronounced than in mice 6—8 weeks old but if the cells are transmitted through the young into the old mice the reverse holds. The age of the host does not modify the constitution of the cells but has a determining effect on their metabolism. W. McC.

**Metabolism of sodium acetoacetate intravenously injected into dogs.** T. E. FRIEDEMANN (J. Biol. Chem., 1936, **116**, 133—161).—When CH<sub>3</sub>Ac-CO<sub>2</sub>Na (I) is injected intravenously into dogs under amytal anaesthesia, the quantity retained ∝ the

rate of injection, to a limit of tolerance of about  $5 \times 10^{-3}M$  per kg. per hr. The limit is not decreased by fasting or pancreatectomy, nor increased by insulin or insulin + glucose. The ratio  $OH \cdot CHMe \cdot CH_2 \cdot CO_2H$ : (I) increases with the rate of injection to a max. val. of about 2.1, both in blood and in urine. Storage of ketones does not appear to take place in the tissues. Base is excreted as  $NaHCO_3$ , corresponding with the injected (I). F. A. A.

**Effect of labour and training on the lactic acid content and the synthesising capacities of the muscles of normal and avitaminous guinea-pigs.** L. I. PALLADINA and B. I. CHAIKINA (Ukrain. Biochem. J., 1936, 9, 719—731).—The lactic acid content of muscles of both normal and scorbutic guinea-pigs is increased by fatigue (28 and 40%, respectively). Previous training results in no increase being shown by normal, but a 21% increase by scorbutic, animals. The capacity of normal muscles for synthesising P compounds is diminished by 20% by fatigue, and increased by training. Muscles of scorbutic animals lose this capacity completely during fatigue. F. A. A.

**Utilisation of glycerol by normal and phosphorus-poisoned rats.** H. DELAUNAY and P. ACCOYER (Compt. rend. Soc. Biol., 1936, 123, 694—695).—The capacity for utilisation of glycerol is reduced in P poisoning. H. G. R.

**Effect of metabolic changes (oxidative processes) on the rate of oxidation of alcohol in the organism.** E. S. ROZOVSKA (Ukrain. Biochem. J., 1936, 9, 751—760).—The rate of oxidation of EtOH *in vivo* in dogs is increased by administration of di-nitrophenol in doses (10—15 mg. per kg.) which do not cause hyperthermia. Smaller increases in the rates of oxidation are produced by hyperthroidism. F. A. A.

**Distribution and metabolism of methyl alcohol in the dog.** M. NEYMARK (Skand. Arch. Physiol., 1936, 73, 227—236).—Widmark's method of micro-oxidation with  $K_2Cr_2O_7$  is suitable for the determination of MeOH in blood if certain modifications are made. When orally administered to dogs, the distribution of MeOH in the body was similar to that of EtOH, but the rate of fall in concn. in the blood was one tenth of that of EtOH. Oral administration of 2:4-dinitrophenol increased the rate of fall. When food was taken at the same time as MeOH there was no decrease in the MeOH concn. in the blood comparable with that shown when food was administered simultaneously with EtOH. F. A. A.

**Occurrence of formic acid in urine following an apple diet.** K. VOIT and H. FRIEDRICH (Klin. Woch., 1935, 14, 1792—1793; Chem. Zentr., 1936, i, 1043).—Fission of apple pectin in the intestine yields MeOH, which is resorbed and after oxidation appears in urine as  $HCO_2H$ . A. G. P.

**Metabolism of women during the reproductive cycle. VII. Utilisation of inorganic elements (a continuous case study of a multipara).** F. C. HUMMEL, H. R. STERNBERGER, H. A. HUNSCHER, and I. G. MACY (J. Nutrition, 1936, 11, 235—255; cf. A., 1936, 513).—Mean daily balances of Ca, Mg,

Na, K, P, S, and Cl' over a prolonged period are recorded and discussed. A. G. P.

**Calcium metastases.** S. TAKAHASHI (Mitt. med. Akad. Kyoto, 1936, 17, 341—343).—In rats, pigeons, rabbits, guinea-pigs, and frogs feeding of S and compounds containing S for 2—3 months produced severe acidosis and typical Ca metastases. Decalcification of the bones and teeth resulted. The Ca which had gone into solution was redeposited principally in the stomach, kidneys, and lungs, and to some extent in other organs. There was a rise in blood-S and -Ca. Ca-rich bladder stones, prostate stones, and pancreas stones were observed. NUTR. ABS. (m)

**Physiology and pathology of calcium metabolism in man.** A. DZSINICH and P. FALUS (Arch. exp. Path. Pharm., 1936, 183, 274—277).—In healthy persons the Ca content of 100 c.c. of blood was increased by 1.0—2.1 mg. by oral administration of 20 g. of a mixture of  $CaCO_3$ , Ca lactate, and Ca phosphate. The increase was 0.30—0.45 mg. in persons having the intestinal contents made alkaline by a milk diet, 0.3—0.6 mg. when 50 units of parathyroid hormone (I) were given together with the mixture, and 1.5—1.8 mg. when 100 units were given. In a patient suffering from osteoporosis, the increase was 3.0 mg. after the mixture and 0.4 mg. after the mixture + 50 units of (I). W. MCC.

**Calcium in therapeutics.** HARDIKAR (Indian Med. Rec., 1934, 54, 153—156).—Utilisation of Ca is associated with dietary fat and vitamin-D, and with exposure to ultra-violet light. The Ca requirement of adults is 650 mg. in 1 pint of milk; 40% of this is not absorbed. Of the blood-Ca, 50% is diffusible and 20% is ionic. CH. ABS. (p)

**Calcium and phosphorus retention in growth, in relation to the form of carbohydrate in the food.** M. SPEIRS and H. C. SHERMAN (J. Nutrition, 1936, 11, 211—218).—Retention of Ca and P by rats was unaffected by the carbohydrate given (maize sugar, maize syrup, maize starch, dextrin, sucrose). A. G. P.

(A) Role of calcium and phosphorus in reproduction. (B) Mineral composition of young rats. W. M. COX, jun., and M. IMBODEN (J. Nutrition, 1936, 11, 147—176, 177—190).—(A) A Ca/P ratio of 1.0 and Ca content 0.49% in the diet produced optimum gestation and lactation in rats. When based on the wt. of 21-day-old young the optimum ratio  $\propto$  the Ca level. Excessive proportions of minerals (2—45%) gave poor results irrespective of the ratio. With a const. intake of P (0.245%) increasing the Ca content of the maternal diet (within limits) gave better reproduction. Still larger proportions of Ca induced rachitic tendencies. Excess of P was tolerated better than excess of Ca.

(B) The composition of the ash of 21-day-old rats is substantially const., irrespective of maternal intake, and may be utilised to calculate the Ca and P contents of the gross body-wt. or (except in cases of high-P diets) of bone ash or calcification. The Ca, P, and ash contents of female rats (21 days) are > those of males. A. G. P.

**Factors controlling assimilation of minerals in the animal organism. I. Effect of magnesium compounds on calcium excretion by kidney and intestine.** J. BEČKA (Sborn. čsl. Akad. Zemed., 1935, 10, 368—377).—The effect of Mg compounds administered to rabbits on the excretion of Ca in urine and faeces depends not only on Mg<sup>++</sup> but also on the anion. Urinary and faecal excretion are affected (increased or decreased) sometimes in the same and sometimes in opposite ways, and the same holds in relation to method of administration (oral and intravenous). NUTR. ABS. (*m*)

**Comparison of mineral and biological potassium in diet experiments.** A. LASNITZKI and M. LASNITZKI (Nature, 1936, 138, 799—800).—Experiments on mice to decide whether K of mineral origin is equiv. to that of biological origin were inconclusive. L. S. T.

**Function of the liver in salt metabolism. I. Sodium chloride content of organs and tissues. II. Sodium chloride of blood and its excretion in bile and urine. III. Absorption of sodium chloride from the gut.** K. TSUSHIMA (J. Chosen Med. Assoc., 1936, 26, 5—6, 11—12, 12—13).—I. When the liver function in rabbits was disturbed by P poisoning, ligature of the bile duct, or other means, the NaCl content of organs and tissues other than the liver did not appear to be affected.

II. In normal rabbits introduction of aq. NaCl into the duodenum caused a rise in blood-NaCl, reaching a max. in 2—5 hr.; in rabbits with deranged liver function a similar max. rise was not obtained for 8—10 hr. The [NaCl] in bile and urine rose parallel with that in the blood.

III. In rabbits with deranged liver function absorption of NaCl from a solution introduced into the intestine was upset. NUTR. ABS. (*m*)

**Ion action and permeability to water: coacervate theory of the plasma membrane.** I. DE HAAN (Protoplasma, 1936, 24, 186—197).—Previous conflicting results on the effect of inorg. salts on the permeability of protoplasmic membranes to H<sub>2</sub>O are due to the fact that, whereas salts with univalent cations increase the permeability at all concns. investigated, those with multivalent cations cause a decrease at low and an increase at higher concns. Protoplasmic membranes probably consist of an auto-complex system of phosphatide coacervate and the permeability min. corresponds with the neutral point of the system. M. A. B.

**Fate of deuterium in the mammalian body.** P. K. SMITH, J. TRACE, and H. G. BARBOUR (J. Biol. Chem., 1936, 116, 371—376).—One sixth of the tissue H of mice is readily exchangeable for the D of D<sub>2</sub>O. The N-rich fraction of tissues contains thrice the amount of exchangeable H present in the Et<sub>2</sub>O extract. D can be fixed in stable form in mammalian tissue. P. G. M.

**General action of Rontgen rays. IV.** E. WOENCKHAUS (Arch. exp. Path. Pharm., 1936, 183, 294—309; cf. A., 1932, 542).—In man, withdrawal, defibrination, and re-injection of 200 c.c. of blood produces a decrease of short duration in the sugar

and leucocyte contents of the blood but when the defibrinated blood is exposed to X-rays before re-injection, the blood-sugar and rate of coagulation increase. W. McC.

**Ammonia formation in irradiated tissues.** H. G. CRABTREE (Biochem. J., 1936, 30, 2140—2143).—Irradiation of tissues (rat liver, brain, testes, Jensen's rat sarcoma) *in vitro* accelerates NH<sub>3</sub> formation. With tumour tissue the effect is independent of the activity of the glycolytic system. P. W. C.

**Effects of intense sound vibrations on ovalbumin.** E. W. FLOSDORF and L. A. CHAMBERS (J. Immunol., 1935, 28, 297—310).—Sonic irradiation of ovalbumin solutions lowers their antigenic activity and alters their specificity. CH. ABS. (*p*)

**Connexion between muscle metabolism and weather. IV.** O. RIESSER [with K. BLOCH] (Biochem. Z., 1936, 288, 238—249; cf. A., 1935, 890).—Variations in the muscle-glycogen and -P<sub>2</sub>O<sub>5</sub> levels of guinea-pigs at altitudes of 1550 and 2660 m. are discussed with reference to possibly related changes in the weather. F. O. H.

**Rates of cleavage of sea-urchin eggs in different latitudes.** H. M. FOX (Nature, 1936, 138, 839).—The rates of cleavage are adapted to the temp. of the seas inhabited. Eggs of a Mediterranean species at a given temp., e.g., 20°, cleave more slowly than those of a northern species. L. S. T.

**Influence of  $p_H$  on the diffusion of acetylcholine.** H. HANDOVSKY and S. FARBER (Compt. rend. Soc. Biol., 1936, 123, 121—123).—Following stimulation, liberation and diffusion are most marked at 6.5—7. H. G. R.

**Protein coagulation as a result of fertilisation.** A. E. MIRSKY (Science, 1936, 84, 333—334).—The changes in the protein of the sea-urchin egg which occur soon after fertilisation are described. Approx. 12% of the total protein in the cell becomes insol. L. S. T.

**Anaerobic recovery of muscle.** R. MARGARIA and G. MORUZZI (Boll. Soc. ital. Biol. sperim., 1936, 11, 662—665).—The energy developed by frog's gastrocnemius muscle on tetanic stimulation under anaerobic conditions and with varying periods of rest was determined. Muscle poisoned by CH<sub>2</sub>I-CO<sub>2</sub>H does not exhibit anaerobic recovery. The recovery process of lactic acid formation from glycogen is 50% completed in 15—20 sec. F. O. H.

**Influence of trauma on the sugars of frog's brain.** G. GORODISSKAJA and P. SIMAKOV (Ukrain. Biochem. J., 1936, 9, 603—612).—Mechanical trauma of frog's brain results in an increase in sugar content dependent on the degree of trauma. F. A. A.

**Explosive gases formed during electrotransurethral resections.** B. F. HAMBLETON, R. W. LACKEY, and R. E. VAN DUZEN (J. Amer. Med. Assoc., 1935, 105, 645—646).—Gases produced during heat cautery contained CO<sub>2</sub>, O<sub>2</sub>, C<sub>2</sub>H<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, CO, and H<sub>2</sub>. CH. ABS. (*p*)

**Carbohydrate tolerance following ligature of the pancreatic ducts of the dog.** P. HOUSSE

(Compt. rend. Soc. Biol., 1936, 123, 519—521).—Tolerance is lowered at first and then returns to normal or slightly subnormal. H. G. R.

**Autocatalytic stimulation of the functions of the lungs.** N. B. MEDVEDEVA (Ukrain. Biochem. J., 1936, 9, 705—712). F. A. A.

**Deuterium and its compounds in relation to biology.** H. C. UREY (Cold Spring Harbor Symp., 1934, 2, 47—56).—A review. CH. ABS. (p)

**Does heavy water influence physiological processes?** H. ERLÉNMEYER and F. VERZAR (Z. Biol., 1936, 97, 519—521).—Heavy water containing 13—80% D<sub>2</sub>O has a significant action on the physiological processes of muscle and heart but preps. containing <10% are inactive (cf. Verzar and Haffter, A., 1936, 632; von Dungern, *ibid.*, 1019). F. O. H.

**Acidosis and hyperglycæmia [in the rabbit] caused by the ammonium ion.** R. HAZARD and C. VAILLE (Compt. rend. Soc. Biol., 1936, 123, 576—578). H. G. R.

**Action of metals. V. Effect of metals on alimentary hyperglycæmia.** L. VOGEL. VI. **Action of copper on the heart.** H. HAUSLER (Arch. exp. Path. Pharm., 1936, 183, 198—210, 211—224; cf. this vol., 5).—V. In rabbits hyperglycæmia produced by administration of glucose (1.25—2.5 g. per kg.) is diminished or prevented by administration of Cu and Zn (2—4 mg. per kg.) but not by that of Mn. The fasting blood-sugar levels are not affected by administration of Cu and Zn.

VI. In the frog's heart poisoned with Cu, the metal is deposited in the connective tissue and on the surface of the cells but does not penetrate into them. Normal activity is restored by application of substances which form Cu complexes. W. McC.

**Effect of various iron compounds on growth and histological picture of cultures of fibroblast.** I, II. Y. NAKAZAWA (Folia Pharmacol. Japon., 1935, 20, 325—346, 358—370).—I. Fe<sup>III</sup> citrate, Na ferro- and ferri-tartrates, Fe(NH<sub>4</sub>)<sub>2</sub>(SO<sub>4</sub>)<sub>2</sub>, FeCl<sub>2</sub>, and FeCl<sub>3</sub> in small concns. increased and at higher concns. inhibited the growth of fibroblast.

II. Colloidal solutions and a hæmolytic solution prepared from chick embryo erythrocytes in small concns. increased and at higher concns. inhibited the growth of fibroblast. In the case of ferratin, solubility was too small for toxic concns. to be attained. CH. ABS. (p)

**Absorption of ferrous and ferric compounds from the intestines of rabbits.** O. FURTH and R. SCHOLL (J. Pharm. Exp. Ther., 1936, 58, 14—32).—Following injection of FeCl<sub>2</sub>, glutamiron, FeSO<sub>4</sub>, and Fe<sup>III</sup> salts into ligated intestinal loops (rabbit), the Fe absorbed was 61.6, 76.0, 39.7, and 19.8—30.5%, respectively. The absorption of Fe<sup>II</sup> is reduced by an acid reaction of the intestinal contents and more Fe is retained by the walls when injected in the Fe<sup>III</sup> state. The rate of absorption could not be correlated with the toxicity but a limited analogy was observed with the rate of diffusion. H. G. R.

**Preservation of fertility in male and female rats on a supplemented milk diet.** H. L. KERL

and V. E. NELSON (Proc. Soc. Exp. Biol. Med., 1936, 33, 490—492).—No appreciable sterility or degeneration of the sexual organs of male and female rats resulted from feeding a diet consisting of cow's milk containing CuSO<sub>4</sub> and FeCl<sub>3</sub>. In female rats excretion of NH<sub>3</sub>, creatine, and creatinine was affected by the diet. W. McC.

**Occurrence of chrysiasis following treatment by gold salts.** W. C. FOWLER (Tubercle, 1935, 16, 539—541).—Chrysiasis fluctuates according to the degree of exposure to light and is associated with deposition of Au in the deeper layers of the skin. CH. ABS. (p)

**Influence of mercury on cultivated tissue. IV. Mercury exhibits a cumulative action on cultures of fibroblast *in vitro*.** V. **Secondary effects.** K. HIRASHIMA (Folia Pharmacol. Japon., 1935, 20, 24—29, 45—55; cf. A., 1936, 108).—IV. Small doses of HgCl<sub>2</sub> accelerate growth of chick-embryo and Hg accumulates in the tissue.

V. Accelerated growth due to Hg treatment gradually returns to normal. CH. ABS. (p)

**Non-protein nitrogen in blood. III. Influence of fluorine on the non-protein-nitrogen of rabbit's blood.** H. S. LEE (J. Chosen Med. Assoc., 1936, 26, 16—17).—A single injection of 0.2 g. of NaF did not produce a significant change in the non-protein-N of rabbit's blood, but continued daily injection of 0.1—0.2 g. of NaF caused an increase. NUTR. ABS. (m)

**Biological activity of an amino-acid with fluorine in the nucleus (fluorotyrosine).** G. LITZKA (Arch. exp. Path. Pharm., 1936, 183, 427—435).—Inorg. F compounds are unsuitable for human therapy. 3-Fluorotyrosine is readily tolerated both as a single dose of 6 mg. and as a daily dose of 1 mg. for several weeks both by men and animals. The substance appears to show the sp. properties of F' without possessing the properties of a cellular and protoplasmic poison. P. W. C.

**Antithyrotropic action of fluorotyrosine.** G. LITZKA (Arch. exp. Path. Pharm., 1936, 183, 436—458).—F and tyrosine both act antagonistically to thyroxine (I). Fluorotyrosine (II) in animal experiments and cases of hyperthyroidism exerts a sp. action several hundred times stronger than, and is without the toxicity of, F'. (II) does not possess antithyroid or antithyrotropic activity but is powerfully antithyrotropic. (II) inhibits the loss of liver- and muscle-glycogen due to administration of (I) or the thyrotropic hormone of the anterior pituitary gland and the loss of wt. occurring in hyperthyroidism. Administration of (II) to mice diminishes their resistance to MeCN and inhibits the increase in resistance due to (I). (II) lowers the blood-sugar of healthy men but not in cases of Basedow's disease. P. W. C.

**Effect of iodine on absorption of cholesterol.** F. H. SHILLITO and K. B. TURNER (Proc. Soc. Exp. Biol. Med., 1936, 33, 600—604).—In dogs, absorption of cholesterol from the gastro-intestinal tract is not prevented by previous administration of aq. KI. W. McC.

**Effect of sodium hydrogen carbonate on the antipyretic action and toxicity of acetanilide.** P. K. SMITH (J. Pharm. Exp. Ther., 1936, 58, 192—198).— $\text{NaHCO}_3$  in a mol. ratio 2:1 causes max. reduction in  $\text{NHPhAc}$  toxicity. Other effects are little changed. E. M. W.

**Influence of concentrated potassium thiocyanate solutions on the structure and volume of the vitreous body.** J. GOEDBLOED (Biochem. J., 1936, 30, 2073—2076).—The decrease in vol. of the vitreous body in conc. aq. KCNS is largely irreversible, KCNS acting as a hydrating agent and in the last resort causing peptisation of the greater part of the vitreous proteins. P. W. C.

**Relation of experimental skin infection to carbohydrate metabolism. Effect of hypertonic glucose and sodium chloride solutions injected intraperitoneally.** D. M. PILLSBURY and G. V. KULCHAR (Amer. J. Med. Sci., 1935, 190, 169—177).

CH. ABS. (*p*)

**Influence of varying conditions on the resorption of sodium iodide from muscle.** III. R. SHIMAZU (Folia Pharmacol. Japon., 1935, 20, 201—205).—Surface application of  $\text{EtOH}$  on the injected area accelerates absorption of the  $\text{NaI}$ . Mustard and turpentine first accelerate and later depress absorption. Skin irritants affect absorption from skin > that from muscle. CH. ABS. (*p*)

**Substances reported to affect the motility of the gall bladder.** W. L. VOEGTLIN and A. C. IVY (Amer. J. Digest. Dis. Nutrition, 1934, 1, 174—177).—Effects of numerous org. and inorg. substances are compared. CH. ABS. (*p*)

**Hydration and permeability of unfertilised *Fucus* eggs (*F. vesiculosus*, L.).** B. RESUIER (Protoplasma, 1935, 24, 531—586).—The power of penetration of various chemical substances into the unfertilised eggs appeared to depend on their lipinsolubility. M. A. B.

**Alimentary disturbance caused by uric or oxalic acid in the diet of the pigeon.** R. LECOQ (Compt. rend., 1936, 203, 627—629; cf. A., 1935, 1015; 1936, 904).—A dose of yeast which protects adult pigeons against polyneuritis fails when 10% of uric acid or 2% of  $\text{H}_2\text{C}_2\text{O}_4$  is incorporated in the diet. About four times the dose is sufficient in the former case. The effect is not central. J. L. D.

**Acetonæmia in guinea-pigs. Effect on blood-calcium.** L. DI PRISCO (Riv. Patol. sper., 1936, 16, 461—468).—In guinea-pigs oral administration and inhalation of  $\text{COMe}_2$  led to degenerative changes in liver and kidneys, appearance of calcareous deposits in kidneys, and reduction in serum-Ca.

NUTR. ABS. (*m*)

**Comparison of toxic effect of pyridine derivatives on ciliated cells of the oyster gill.** S. NOMURA and T. IMAI (Bull. Inst. Phys. Chem. Res. Japan, 1936, 15, 1202—1208).—The non-movement of the terminal cilia at the ventral margin of the gill was used as a criterion of death of the tissue after immersion in a solution of the compound. Using

KCN and  $\text{HgCl}_2$  for comparison, the degree of toxicity is as follows:  $\text{Cd}(\text{CNS})_2 \cdot 3\text{C}_5\text{H}_5\text{N} < \text{KCN} < \text{Cu}(\text{CNS})_2 \cdot \text{C}_5\text{H}_5\text{N} < \text{CdSiF}_6 \cdot 4\text{C}_5\text{H}_5\text{N} < \text{CuSiF}_6 \cdot 4\text{C}_5\text{H}_5\text{N} \cdot \text{H}_2\text{O} < \text{HgCl}_2 < \text{HgCl}_2 \cdot \text{C}_5\text{H}_5\text{N}$ .

J. N. A.

**Unusual case of esterification in muscle.** G. T. CORI and C. F. CORI (J. Biol. Chem., 1936, 116, 129—132).—Dinitrophenol does not significantly alter the hexose monophosphate (I) content of anaerobic frog muscle, but greatly increases its production in the presence of adrenaline (II). Lactic acid production is accelerated, and phosphocreatine diminishes. Caffeine does not increase the esterification, its action with (II) being additive. The (I) rapidly disappears in the presence of  $\text{O}_2$ . F. A. A.

**Sterilising action of chloropicrin on eggs of the bed bug (*Cimex lectularius*, Mer.).** H. GOUNELLE and Y. RAOUL (Compt. rend., 1936, 203, 689—691).—Chloropicrin (I) is toxic to the eggs when the latter are exposed for 48 hr. to an atm. containing 5 g. of (I) per cu. m. During treatment the  $p_{\text{H}}$  of the interior of the egg changes from 5.08 to 4.56 (mean vals.). J. N. A.

[Pharmacology of] phenanthrene derivatives. VII. Comparison of analogous phenanthrene and dibenzfuran derivatives. N. B. EDDY (J. Pharm. Exp. Ther., 1936, 58, 159—170).—The analgesic and toxic effects of dibenzfuran derivatives are > those of the corresponding phenanthrene derivatives. The relation of analgesic to toxic doses is approx. the same. Variation in analgesic effect is parallel in the two series. E. M. W.

**Action of benzpyrene on the testes.** H. TUCKMANN and M. DEMAY (Compt. rend. Soc. Biol., 1936, 123, 686—690).—Necrosis of the seminal tubules, an oestrogenic action (< that of folliculin), and inhibition of spermatogenesis were observed in rats.

H. G. R.

**Influence of various substances on the change of state of uric acid in serum.** III. Y. NUKITA (Folia Pharmacol. Japon., 1935, 20, 236—241).—Excretion of uric acid was increased by cinchophen and Na taurocholate and decreased by  $\text{NaOBz}$ , more so by Na salicylate, and also by urea + glycine.

CH. ABS. (*p*)

**Hypertension. I. Production of experimental hypertension; correlated effect on nitrogen distribution in blood-proteins.** H. A. RAFTSKY, A. BERNHARD, and G. L. ROHDENBURG (Amer. J. Med. Sci., 1935, 190, 187—199).—Injection of U nitrate into rabbits produced nephritis and hypertension, that of cholesterol and guanidine carbonate a mild hypertension, and that of aspartic acid a hypertension which was not dependent on the  $\text{NH}_2$  or  $\text{C}_2\text{O}_4$  groups. In the last-named case the  $(\text{NH}_2)_1\text{-N}$  of the serum increased and the basic  $\text{NH}_2$  decreased. CH. ABS. (*p*)

**Mechanism of the irreversible diffusion of dyes through the frog's skin.** A. ECKSTEIN (Pflüger's Arch., 1936, 237, 125—142).—Basic dyes [methylene-blue (I) and Me-violet] diffuse more readily through the frog's skin from the serous to the epithelial coat than in the opposite direction; with acid

dyes the opposite is true. These effects were the same when the membrane had been killed with KCN and are therefore not due to the physiological activity of the membrane. In the case of (I) the effect is due to reduction (probably enzymic) of the dye by the serous coat, but not by the epithelium, and re-oxidation after diffusion. The effect is probably due to different partition coeffs. of (I) between solvent and membrane on the two sides. The action of the frog's skin was imitated by using parchment soaked in oleic acid-NH<sub>2</sub>Ph as a "two-phase" membrane. (I) diffused more rapidly from the soaked side. M. A. B.

**Secretion of dyestuffs by the stomach.** I. MATSUO (Japon. J. Gastroenterol., 1934, 6, 495—546).—Factors affecting the secretion are examined, and the measurement of stomach function by dye secretion is discussed. CH. ABS. (p)

**Influence of amino-acids on the adrenaline-iodic acid value.** K. TERAI and H. ICHITSUBO (Folia Pharmacol. Japon., 1935, 20, 206—218).—Addition of NH<sub>2</sub>-acids has no influence on the HIO<sub>3</sub> val. of adrenaline. In alkaline solution vals. decrease rapidly and NH<sub>2</sub>-acid retards this decrease. CH. ABS. (p)

**Action of amino-acids on the isolated toad heart.** S. IWO (Folia Pharmacol. Japon., 1935, 20, 230—235).—The ionotropic action of 13 NH<sub>2</sub>-acids is examined. No chronotropic action was apparent. CH. ABS. (p)

**Influence of aminoacetyrocatechol on blood-sugar picture and on the glycogen content of liver and muscle.** K. TACHIBANA (Folia Pharmacol. Japon., 1935, 20, 191—200).—Aminoacetyrocatechol (I) causes hyperglycæmia and inhibits the action of yohimbine even after double splanchnectomy. Cocaine increases and pituitrin decreases its action. In barbital narcosis (I) markedly increases liver-glycogen; muscle-glycogen is only slightly diminished. CH. ABS. (p)

**Influence of cerebral cortex on calcium metabolism.** R. UCHIHASHI (Folia Pharmacol. Japon., 1935, 20, 219—229).—"Urethan," a cerebral depressant, accentuates the hypocalcifying action of picrotoxin and veratrine. Paraldehyde and small doses of CHCl<sub>3</sub> act similarly: large doses of CHCl<sub>3</sub> have the opposite effect. Decorticated animals react more readily than controls. A cortical regulation of Ca metabolism is postulated. CH. ABS. (p)

**Physiology of carnitine and acetylcarnitine.** P. WEGGER (Biochem. Z., 1936, 287, 424—432).—Carnitine is without action on the frog's heart in low concs. but in conc. solutions (3—5%) it irreversibly injures the heart and is only partly inhibited by atropine. Acetylcarnitine (I) exerts a reversible inhibition of the heart, the action being inhibited by atropine and increased by eserine. (I) is inactivated by keeping with frog's heart extract but is not inactivated if the extract is first heated to 56°. P. W. C.

**[Effects on blood pressure of] ethers of choline and allied compounds.** R. HUNT and R. R. RENSHAW (J. Pharm. Exp. Ther., 1936, 58, 140—154).—The increase in blood pressure produced by the Ph ether of  $\alpha$ -methylcholine is reduced by intro-

ducing Me, Et, Pr<sup>*β*</sup>, or NH<sub>2</sub> into the mol., and also by  $\beta$ -*o*-tolvloxethyltriammonium bromide and like compounds. Me and Et ethers of  $\beta$ -methylcholine cause a fall of pressure which is prevented by atropine (I). Small doses of the Pr<sup>*β*</sup> ether cause a fall and larger doses a fall followed by a rise; after (I) a rise only is produced. The ethers of NH<sub>2</sub>Et<sub>3</sub> salts prevent rise of pressure; certain heterocyclic compounds slightly increase it. E. M. W.

**Influence of histamine on acetylcholine action.** G. BAYER and T. WENSE (Arch. exp. Path. Pharm., 1936, 182, 533—536).—Pretreatment of leech preps. with histamine enhances the action of acetylcholine (I), due to inhibition of hydrolysis of (I) by blood-esterase (cf. Minz, A., 1932, 966). F. O. H.

**Inhibitory effect of histamine on gastric secretion.** A. ALLEY (Amer. J. Digest. Dis. Nutrition, 1935, 1, 787—794).—Mechanism of the action is examined. CH. ABS. (p)

**Effect of autoclaved pancreas on lipins of blood and liver in depancreatized dogs maintained with insulin.** A. KAPLAN and I. L. CHAIKOFF (Proc. Soc. Exp. Biol. Med., 1936, 34, 606—607).—Autoclaved pancreas in the diet maintains the total fatty acids of the liver at about the normal val. (2.7—2.9%). P. G. M.

**Hypoglycæmic action of liver extract.** A. BRIGANTI (Riv. Patol. sper., 1936, 16, 469—496).—Liver extract contains a substance capable of reducing the blood-sugar level, the effect being marked in diabetics and depancreatized dogs, but much weaker in normal subjects. The substance probably increases the deposition of glycogen in the liver. NUTR. ABS. (m)

**Effect of extracts of guinea-pig organs on the perfused isolated rabbit lung.** I. TOMINAGA (Folia Endocrinol. Japon., 1934, 10, 56—57).—Extracts of lung, intestine, liver, and kidney caused a decrease in the amount of treated lung perfused, in the amplitude of the respiration curve, and in the wt. of the lung preps. The activity of the extracts decreased in the order named. CH. ABS. (p)

**Anti-growth effect of lipin fractions of tissue extracts.** F. A. MCKUNKIN and J. W. HENRY (Amer. J. Path., 1935, 11, 353—363).—Injection into young rats of lipin extracts from kidney, myocardium, and liver produced anti-growth effects on kidney and liver. The inhibitory substance is probably in the phospholipin fraction. CH. ABS. (p)

**Effect of acid-alcohol or acetone extracts of thyroid gland on nitrogen metabolism.** I. Normal white rats. II. Hyperthyroid rats. J. MATSUI (Folia Endocrinol. Japon., 1934, 10, 53—54, 54—55).—I. The extracts increased the total urinary N in rats, COMe<sub>2</sub> extracts being the more active.

II. The increased N metabolism produced by oral administration of epithelial cellular material was lowered by the extracts given orally. The COMe<sub>2</sub> extract was the more effective. CH. ABS. (p)

**Influence of mucilaginous substances on the emptying of the stomach.** H. NECHELES, H. I. SAPOZNIK, R. ARENS, and J. MEYER (Amer. J. Digest.

Dis. Nutrition, 1934, 1, 684—688).—Hog mucin, okra, olive oil, and agar decrease the emptying time. Okra does not impair digestion of meat but decreases gastric secretion. CH. ABS. (p)

Pharmacological action of tuberculo-protein in normal and tuberculous animals. M. I. SMITH (Amer. Rev. Tuberc., 1935, 32, 98—112).—Tuberculo-protein has a primary toxicity to normal animals but a much greater toxicity to tuberculous animals. Anaphylactic and tuberculin hypersensitivity are distinct and independent phenomena. CH. ABS. (p)

Tissue reactions of the lung to intratracheal injection of particulate sericite. W. S. LEMON and G. M. HIGGINS (Amer. Rev. Tuberc., 1935, 32, 243—256). CH. ABS. (p)

Epithelial anaesthesia. L. STAMBOVSKY (Drug Cosmetic Ind., 1935, 37, 175—176, 192).—Comparative effects of alkyl *p*-aminobenzoates on sunburn are examined. Action of these compounds on epidermal tissue is related to their solubility in oil, and that on mucous membrane to solubility in H<sub>2</sub>O. Activity is diminished by substitution or addition in the alkyl or NH<sub>2</sub> groups. CH. ABS. (p)

Intravenous anaesthesia with evipan. E. VAN ACKER (Ann. Bull. Soc. Roy. med. Gand, 1934, 13, 216—217).—A review. CH. ABS. (p)

Surface anaesthesia in ophthalmology. J. G. BELLOW (Arch. Ophthalmol., 1934, 12, 824—832).—The order of effectiveness was, *p*-butylaminobenzoyle-dimethylaminoethanol hydrochloride > nupercaine > butyn > cocaine > phenacaine > metycaine. CH. ABS. (p)

Experimental injection of ethyl alcohol into the lumbar subarachnoid space. R. B. ARD and H. C. NAFFZIGER (West. J. Surg. Obstet. Gynecol., 1935, 43, 377—387). CH. ABS. (p)

Hydrodynamics of analgesics in the subarachnoid fluid of man. Diazotised procaine in artificial dural sacs. G. R. VEHR (West. J. Surg. Obstet. Gynecol., 1935, 43, 16—32). CH. ABS. (p)

Prolonged analgesia in malignancies. C. A. DE PUY (West. J. Surg. Obstet. Gynecol., 1935, 43, 105—112).—Effects of subarachnoid injections of abs. EtOH are described. CH. ABS. (p)

Toxicity and local anaesthetic activity of alkyl esters of 2-furoic acid. N. M. PHATAK and G. A. EMERSON (J. Pharm. Exp. Ther., 1936, 58, 174—177).—Toxicity of the alkyl esters of 2-furoic acid increases from Me to Pr and local anaesthetic activity from Me to amyl. The lower toxicity of Bu and amyl esters may be due to their lower solubility. E. M. W.

Anaesthetic properties of tetrahydrofuran. R. W. STOUTON and B. H. ROBBINS (J. Pharm. Exp. Ther., 1936, 58, 171—173).—Tetrahydrofuran anaesthesia in mice and dogs is marked by certain toxic symptoms. E. M. W.

*N*-Alkylbarbituric acid derivatives. E. E. SWANSON (J. Amer. Pharm. Assoc., 1936, 25, 858—859).—The anaesthetic and lethal action of 14 deriv-

atives determined in rats indicates that *N*-alkyl (Me or Et) substitution reduces the duration of action. F. O. H.

[Pharmacology of] barbiturates. XVII. Effect of prolonged chloroform anaesthesia on duration of action of barbiturates. T. KOPFANYI, J. M. DILLE, and C. R. LINEGAR. XVIII. Peripheral action of barbiturates. C. R. LINEGAR, J. M. DILLE, and T. KOPFANYI (J. Pharm. Exp. Ther., 1936, 58, 119—127, 128—134).—XVII. CHCl<sub>3</sub> anaesthesia for 2 hr. prolongs the anaesthetic action of pentobarbital (I), and barbital (II), given 24 hr. later, increases the depth of anaesthesia and the speed of reaction of animals, and induces greater retention of (I) and (II) in blood and organs. CHCl<sub>3</sub> probably injures the central nervous system, thus facilitating the action of barbiturates.

XVIII. The peripheral vagus is paralysed by moderate doses of amytal, pernocton, and (I), and by large doses of (II) but not by phenobarbital. The central vagus is not paralysed by barbiturates. Pilocarpine and acetylcholine, and to some extent eserine, restore peripheral vagus activity. Barbiturate action is on the peripheral ganglionic cells of the heart. E. M. W.

Spinal anaesthesia in general: nupercaine. P. E. SPANGLER (West. J. Surg. Obstet. Gynecol., 1934, 42, 597—603, 646—649). CH. ABS. (p)

Effect of antipyretics on the action of soporifics. O. GRENDT and O. HUHN (Arch. exp. Path. Pharm., 1936, 183, 236—255).—In rabbits, pyramidal one antagonises the hypnosis produced by bromural. W. McC.

Influence of narcotics on the vitamin-C content of spinal fluid and brain. F. PLAUT and M. BULOW (Klin. Woch., 1935, 14, 1716—1717; Chem. Zentr., 1936, i, 1045).—Narcotics have no effect. A. G. P.

(A) Effect of narcotics of the fatty series on the sensitivity of the external ear and skin of the back of guinea-pigs. (B) Effect of opium alkaloids. (C) Surface anaesthesia in the external ear of the guinea-pig. II—IV. S. IKEBE (Folia Pharmacol. Japon., 1935, 20, 347—350, 351—357; Opera Orig., 1—9, 10—17, 37—44; cf. A., 1935, 1410).—(A) Administered subcutaneously ethylurethane gave complete analgesia; paraldehyde and chloral hydrate showed hypalgesia.

(B) Morphine, heroin, pantopon, codeine, and papaverine, given subcutaneously, produced analgesia or hypalgesia, the relative action being in the (descending) order named.

(C) II. The local anaesthetic effect of cocaine (I) and procaine (II) was increased by EtOH, PhOH, *p*-cresol (III), by increasing *p*<sub>H</sub>, and, slightly, by menthol and salicylic acid.

(C) III. Skin sensitivity was decreased by K, Li, Ca, and Sr but not by Mg or NH<sub>4</sub> chlorides. Local anaesthetic action of (I) and (II) was increased considerably by K, less by Ca, very little by Sr, NH<sub>4</sub>, and Li, and not at all by Mg salts.

(C) IV. Anaesthetic action of (I) and (II) was increased by NaOH, EtOH, and KCl and that of nupercaine by (III) and C<sub>5</sub>H<sub>11</sub>·OH. PhOH and

(III) were particularly effective in presence of adrenaline. CH. ABS. (p)

**Minimal hypnotic effect, toxicity, and pathological effect of the sodium and magnesium salts of phenobarbital.** W. F. TAYLOR and R. W. LACKEY (Proc. Soc. Exp. Biol. Med., 1936, 33, 621—624).—The min. lethal dose of Na and Mg phenobarbital is about 215 mg. per kg. for rats and 115 mg. for dogs. For dogs the min. hypnotic doses are 20 mg. per kg. (orally) and 15 mg. (intravenously). The hypnotic effect of the Mg salt is > that of the Na salt when given intravenously to dogs in doses of 30 mg. per kg., but there is no such difference when the salts are given orally. W. McC.

**Influence of diallylmalonylurea on metabolic response of the cat to dinitrophenol.** G. BREWER (J. Pharm. Exp. Ther., 1936, 58, 135—139).—The increase in metabolic rate of the cat produced by dinitrophenol (I) is prevented by the administration of diallylmalonylurea shortly before or after (I).

E. M. W.

**Creatine dynamics in pigeon's muscle under the influence of various pharmacological agents.** II. **Poisons of the central and vegetative nervous systems.** A. D. SCHTEINBERG (Ukrain. Biochem. J., 1936, 9, 943—959).—The effect produced depends on the place and mode of action of the agent. Compounds such as  $C_6H_6$  and picrotoxin, which influence the sub-cortical centres, cause a marked rise in the muscle-creatine (I) of pigeons. Caffeine produces a rise of short duration, followed by a diminution. Deep narcosis by  $CHCl_3$  or  $Et_2O$  decreases (I) for 24 hr.; slight narcosis increases (I). Morphia produces a transitory diminution in (I), followed by a small rise approx. to normal vals. Adrenaline produces first a rise, and after 3 hr. a fall. Parasympathetic-stimulating substances (arecoline, pilocarpine) diminish (I). F. A. A.

**Earthworms as test objects for determining the value of drugs to be used in human intestinal helminth infestations.** P. D. LAMSON and C. B. WARD (Science, 1936, 84, 293—294).—A study of the toxicity of various substances towards earthworms and pig *Ascaris* showed no correlation of action. L. S. T.

**Chemotherapy of germanin and arsine acids.** I. M. OESTERLIN (Zentr. Bakt. Par., 1935, I, 135, 347—364).—A microchemical method for determining therapeutic vals. of As compounds is described. The activity of As-protein compounds depends on the mol. wt. of the protein. Haemoglobin increases the index of atoxyl (I). Peptone has no effect. Combination with a high-mol. protein induces activity in the normally inactive arsanilic acid (II). (I) is accumulated by trypanosomes without change of mol. structure. Therapeutic properties of casein (III)—(I) and of (III)—diazotised (II) are examined. A. G. P.

**cycloPropane [pharmacology].** R. M. WATERS (Brit. Med. J., 1936, No. 3959, 1013—1017).—A discussion of recent experimental work. A. G. P.

**Pharmacology of pinacolone.** J. C. KRANTZ, jun., C. J. CARR, R. MUSSER, and F. F. BECK (J. Amer. Pharm. Assoc., 1936, 25, 852—855).—1%

aq. COMeBu<sup>r</sup> has no significant bactericidal action. No hypnotic properties were observed. F. O. H.

**[Physiological] action of *p*-hydroxybenzylguanidine.** IV. Relation of thyroid gland, spleen, and iodine to blood-coagulating action and detoxication of *p*-hydroxybenzylguanidine. V. Relation of pituitary, pancreas, and adrenal. A. KURODA (Folia Pharmacol. Japon., 1935, 20, Op. Orig., 18—36, 59—70; cf. A., 1935, 894).—IV. Thyroid increases and spleen decreases the clotting time. Thyroid and I detoxicate the drug.

V. Extracts of anterior pituitary detoxicate and decrease the clotting power of the drug. Thyroxine has a strong action. Extracts of posterior pituitary, pancreas, and adrenals have no action.

CH. ABS. (p)

**Change in shape of melanophores in frog skin.** II. Influence of adrenaline and histamine on extension of melanophores produced by posterior pituitary extract. III. Influence of cocaine and related drugs. K. MATSUDA (Folia Pharmacol. Japon., 1935, 20, 90—116, 117—131).—II. The effect of pituglandol (I) on the melanophores is counteracted by adrenaline, adrenalone, *dl*-3:4-dihydroxyphenylalanine, tyramine, tetrahydronaphthylamine, histamine, and ephedrine, the activity of the drugs being in the (descending) order named.

III. Cocaine, tutocaine, and procaine also counteract the effect of (I). CH. ABS. (p)

**Influence of various purine derivatives on growth and morphological picture of cultures of fibroblast *in vitro*.** M. MAEDA (Folia Pharmacol. Japon., 1935, 20, 293—310).—The growth of fibroblast cultures from the ventricle of chick embryo was increased by small and inhibited by higher concns. of caffeine, theobromine, theophylline, xanthine, caffeine Na benzoate, theobromine Na salicylate and acetate. CH. ABS. (p)

(A) Influence of salicylic acid, sodium salicylate, and of soluble aspirin on growth of cultures of fibroblast *in vitro* from the ventricle and on pigmented epithelial cells of the iris: histological changes caused by these drugs. (B) Influence of certain drugs of the antipyretic group on the cultures. K. SATTO (Folia Pharmacol. Japon., 1935, 20, 269—283, 284—292).—(A) Low concns. of the drugs increased and higher concns. decreased the growth of both tissues.

(B) Antipyrine, pyramidone, salipyrine, and NHPAc produced effects similar to the above.

CH. ABS. (p)

**Effect of intra-arterial injection of substances which injure the capillaries on internal gaseous metabolism and oxygen utilisation.** O. KLEIN and E. SPIEGEL (Arch. exp. Path. Pharm., 1936, 183, 542—560).—By intra-arterial injection of various substances which affect capillary tonus [pituirrin, histamine, perabrodil, uroselectan, catalysin (I), hypertonic NaCl] the liberation of  $O_2$  in the vascular region of the artery is considerably or totally inhibited. Injections of (I) and Ca salts bring about this result only in high concns., low concns. having the opposite

effect. The  $\text{CO}_2$  exchange between blood and tissues is not or only slightly affected. P. W. C.

**Experimental modification of the velocity of absorption. I. Inhibition of absorption of subcutaneously injected poisons by substances of the adrenaline series.** H. ROTTER (Arch. exp. Path. Pharm., 1936, 183, 595—606).—Adrenaline, when subcutaneously injected into mice at the same site as a lethal dose of strychnine, has a protective action > that of any of the adrenaline-like substances (ephedrine, sympathol, etc.) examined and, although the most toxic, has the highest therapeutic val. as an antidote. P. W. C.

**Effect of myocardial destructive agents on the creatine content of the rabbit's heart.** G. DECHERD, G. HERRMANN, and P. ERHARD (Proc. Soc. Exp. Biol. Med., 1936, 33, 519—520).—Intravenous administration of caffeine followed by adrenaline (I) and of (I) alone usually increases the creatine content of the heart by 20—25% during 12 hr., the val. diminishing thereafter until 66% of the normal val. is reached and death occurs. The decrease is possibly a measure of the extent of myocardial damage. When the decrease is not so great the content rises again to normal and recovery ensues. W. McC.

**Action of ephedrine on isolated rabbit intestine.** I, II. Y. NUKITA (Folia Pharmacol. Japon., 1935, 20, 153—161, 242—256).—I. Adrenaline reinforced the action of small doses of ephedrine (I) but antagonised that of larger doses; ergotamine increased the action of large doses. Nicotine had no effect.

II. Influence of acetylcholine, atropine, papaverine, apomorphine, emetine, and Ba on the action of (I) is examined. CH. ABS. (*p*)

**Action of vegetable stimulants on emulsions.** G. BAYER and T. WENSE (Protoplasma, 1935, 24, 281—285).—Staining with Os and microscopical examination showed that the phase inversion produced in oil-in- $\text{H}_2\text{O}$  emulsions by  $\text{BaCl}_2$  is inhibited by adrenaline (I) and ephedrine, whereas pilocarpine (II), choline (III), and acetylcholine increased the effect of  $\text{BaCl}_2$ . Eserine had no effect. Atropine inhibited the action of (II) and (III) but increased that of (I). Curare did not affect the action of (III), nor ergotamine that of (I). M. A. B.

**Absorption of adrenaline and nicotine by the pericardium.** G. BALTACEANU, C. VASILIU, and A. NOVAC (Compt. rend. Soc. Biol., 1936, 123, 833—836).—Adrenaline is not oxidised and only slightly absorbed whereas nicotine is very readily absorbed. H. G. R.

**Effects of nicotine, coniine, piperidine, and sparteine on growth and morphological picture of *in vitro* cultures of fibroblast.** H. YAMADA (Folia Pharmacol. Japon., 1935, 20, 311—324).—Small concns. of the drugs promote growth and larger concns. kill the tissue. CH. ABS. (*p*)

**Poisoning by nicotine.** A. PALMER (Med. J. Australia, 1935, 1, 624).—In a case of poisoning considerable amounts of nicotine were found in kidney, liver, and spleen. CH. ABS. (*p*)

**Amino- and acylamino-nicotines.**—See A., II, 38.

**Action of veratrine, picrotoxin, and cocaine on the rabbit uterus *in situ*.** K. KUNISHO (Folia Pharmacol. Japon., 1935, 20, 371—379).—Stimulative effects of the drugs are recorded. The effects were prevented by yohimbine (I) but not by atropine (II). On the isolated uterus the drugs had similar action, but neither (I) nor (II) had any inhibitory influence. CH. ABS. (*p*)

**Curare-like action of *Erythrina americana*.** A. J. LEHMAN (Proc. Soc. Exp. Biol. Med., 1936, 33, 501—503).—The pharmacological action of *E. americana* resembles that of curare. W. McC.

**Pharmacology of the principal alkaloids and of mixtures of total alkaloids of cinchona bark.** A. SIMON and P. ZSOLDOS (Arch. exp. Path. Pharm., 1936, 183, 459—466).—The effect of administration of quinine (I), quinidine (II), cinchonine (III), and cinchonidine (IV) on the temp. of normal and febrile rabbits is investigated. (II) has the greatest antipyretic action. After intravenous administration of (IV), the pressor action of adrenaline is reversed. Ephedrine and sympathol are antagonised whilst extracts of posterior lobe of the pituitary gland are synergised in their pressor action. The toxicity of (I) hydrochloride and of mixtures with the other alkaloids is determined. The toxic, antipyretic, uterine, and cardiac actions of the alkaloid mixture closely resemble those of (I). The protective action against the cardiac action of aconitine in cats gives the order (II) > (I) > (III), (IV). P. W. C.

**Hepatic damage in dogs by feeding cinchophen.** W. C. HUNTER and G. A. C. SNYDER (West. J. Surg. Obstet. Gynecol., 1934, 42, 288).—Continuous feeding of cinchophen produced no liver damage. CH. ABS. (*p*)

**Reaction of embryonic chick heart to (a) quinidine, cinchonine, cinchonidine, optoquin, eucupine, and vuzine, (b) sinomenine, parasinomenine, dihydrosinomenine, and deoxy-4H-sinomenine, with special reference to the developmental material of these hearts.** T. NAKANO (Folia Pharmacol. Japon., 1935, 20, 1—14, 15—23).—(a) Optoquin has the greatest and cinchonine the weakest depressive effect on heart action. Atropine does not remove the depression.

(b) All the drugs stimulate heart action, parasinomenine being the most effective. CH. ABS. (*p*)

**[Effect of] combinations of quinine with other uterine tonics on the human uterus.** K. KUNISHO (Folia Pharmacol. Japon., 1935, 20, 145—152).—Adrenaline potentiated the action of pituitrin and histamine on strips of uterus. Ba produced varied effects and quinine showed no potentiation. CH. ABS. (*p*)

**Effect of papaverine hydrochloride and sodium nitrate on the perfused, isolated rabbit lung, especially one altered by histamine.** I. TOMINAGA (Folia Endocrinol. Japon., 1934, 10, 57—58).—Disturbances in lung circulation caused by histamine were lessened by papaverine hydrochloride and intensified by  $\text{NaNO}_2$ . CH. ABS. (*p*)

Effects of syntropan, enatin, bromosalizol, and eupaverine on the human ureter. K. SAMAAAN and M. I. E. ASREEGY (Brit. J. Urol., 1935, 7, 116—123).—The action of syntropan in relaxing excised muscle of the human ureter resembled but was weaker than that of atropine. Enatin (I) and bromosalizol (II) relaxed the muscle by direct action but were inferior to visammin. As an antispasmodic eupaverine was more effective than papaverine, (I), or (II). CH. ABS. (p)

Influence of strychnine on growth and on histological picture of cultures of fibroblast *in vitro*: cumulative action of the drug. K. HIRASHIMA (Folia Pharmacol. Japon., 1935, 20, 132—141).—Low concns. of strychnine temporarily accelerate and higher concns. inhibit the growth of fibroblast. CH. ABS. (p)

Action of yohimbine on the vegetative nervous system. P. WEGER (Upsala Lakarefören. Forhandl., 1934, 40, No. 1/2, 113—167).—Pharmacological action of yohimbine (I) alone and with Ba or adrenaline (II) is examined. (I) antagonised the action of (II) on isolated rabbit uterus and was more rapidly leached from the tissue than was ergotamine. CH. ABS. (p)

Pharmacological action of flavonol glucoside of species of *Forsythia*. A. G. CZIMMER (Arch. exp. Path. Pharm., 1936, 183, 587—594).—Blooms of *F. suspensa viridissima* etc. contain a pharmacologically active substance (I), m.p. 172—178°, belonging to the flavonol group and probably identical with quercetin glucoside. (I) greatly increases the activity of the fatigued or hypodynamic, but not that of the normal, frog's heart. Given parenterally, (I) is not toxic to rabbits, rats, guinea-pigs, and cats. In rats (I) has a diuretic action but not in other animals. P. W. C.

Action of quercitrin and quercetin on uninjured and poisoned frog's heart. Vitamin-*B*<sub>1</sub>. A. VON JENEY and A. CZIMMER (Arch. exp. Path. Pharm., 1936, 183, 571—586).—The activity of the normal or fatigued heart is increased by quercitrin (I) and quercetin (II). Hearts stopped by CHCl3, urethane, or quinine hydrochloride are restarted by (I) and (II), the toxic action being inhibited and the original amplitude and frequency regained. (I) and (II) increase the heart activity after previous inhibition by lactic acid. (II) and probably other flavonol pigments present in the lactic acid-dehydrogenase of heart-muscle play, in addition to vitamin-*B*<sub>1</sub>, the rôle of co-enzyme. P. W. C.

Absorption of digitalin and ouabain by the pericardium. G. BALTACEANU, C. VASILIU, and A. NOVAC (Compt. rend. Soc. Biol., 1936, 123, 837—839).—The effect of these substances is prolonged on account of slow absorption. H. G. R.

Creatine content of normal and hypertrophied rabbit's heart after administration of digitalis. G. HERRMANN, G. DECHERD, E. H. SCHWAB, and P. ERHARD (Proc. Soc. Exp. Biol. Med., 1936, 33, 522—524).—Administration of digalen and digifolene increased the creatine content of the normal hearts. W. McC.

True glucosides of *Digitalis lanata*. I. Comparative toxicities. A. RABBENO (Boll. Soc. ital. Biol. sperim., 1936, 11, 674—677).—The 50% lethal dose to *Discoglossus pictus* gives a ratio for the toxicities of total digilanid and digilanid-*A*, -*B*, and -*C* of 1:1.2:3.7:0.66, respectively. The vals. are compared with those for *Rana esculenta*. F. O. H.

Activity of constituents of digitalis leaf and of strophanthin on application to various parts of the alimentary canal: change of activity induced by addition of ethyl alcohol and glycerol. III. H. KOIKE (Folia Pharmacol. Japon., 1935, 20, 257—266).—The action of strophanthin was increased by EtOH (≈10%) and by glycerol (I) (≈25%). Higher concns. had the reverse effect. In the intestinal tract the effect of both substances was smaller, (I) showing the greater activity. CH. ABS. (p)

Therapeutic and toxic effects of strophanthin. F. ISAMAT and F. GRUNBAUM (Arch. exp. Path. Pharm., 1936, 183, 256—266).—The differences between therapeutic dose and toxic or min. lethal dose and between toxic and min. lethal dose for *g*-strophanthin and, to a smaller extent, ouabain are < the corresponding differences for *k*-strophanthin. W. McC.

Pharmacology of the kidneys. A. BENEDICENTI (Boll. Soc. ital. Biol. sperim., 1936, 11, 630—656).—A lecture. F. O. H.

Plant poisoning in stock: development of tolerance. D. G. STEYN (Onderstepoort J. Vet. Sci., 1935, 4, 417—420).—The toxic principle of *Urginea burkei*, Baker, is of the digitalis group. CH. ABS. (p)

Antidotal action of potassium permanganate. R. A. HATCHER (J. Amer. Med. Assoc., 1935, 105, 502—504).—KMnO4 is effective in cases of poisoning by aconitine, amidopyrine, antipyrine, morphine, or strychnine, and in alkaline solution destroys HCN or NaCN in the stomach, but is useless in poisoning by yellow P, cocaine, or atropine. CH. ABS. (p)

Toxicity of poisonous plants in the Union of S. Africa. D. G. STEYN Onderstepoort J. Vet. Sci. 1935, 4, 399—415).—Various cyanogenetic plants are examined. CH. ABS. (p)

Toxic action of quinol. H. OETTEL (Arch. exp. Path. Pharm., 1936, 183, 319—362).—The lethal dose for cats is 60—100 mg. per kg. No appreciable amount of methæmoglobin (I) appears in the blood of living cats receiving quinol (II) but (I) appears abundantly after death. (II) in milk is less toxic than (II) in H<sub>2</sub>O. Cats acquire tolerance, persisting for months, to sublethal doses of (II). (II) should not be used as a preservative. W. McC.

Toxicity of dioxan. A. FAIRLEY, E. C. LINTON, and A. H. FORD-MOORE (J. Hyg., 1936, 36, 341—347).—1:4-Dioxan (I) is oxidised *in vitro* to H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> and diglycollic acid. Renal changes can be produced in rabbits by the intravenous injection of both Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> and Na diglycollate or by applying Et<sub>2</sub>C<sub>2</sub>O<sub>4</sub> to the skin. The lesions are similar to those produced by (I). W. L. D.

Methæmoglobin formation during poisoning by glyceryl trinitrate. G. ORESTANO (Boll. Soc.

ital. Biol. sperim., 1936, 11, 658—660).—Intramuscular injection into rabbits of the nitrate (0.5—1.0 g. per kg.) produces death during which 38.5—77.4% of the total hæmoglobin is converted into methæmoglobin. F. O. H.

**Toxicology of formic acid.** F. BALLOTTA (Boll. Chim. farm., 1936, 75, 577—580).—The normal occurrence and detection of  $\text{HCO}_2\text{H}$  in tissues and body-fluids are discussed.  $\text{HCO}_2\text{H}$  in tissues is detected by extraction with aq.  $\text{Na}_2\text{CO}_3$ , distillation of the acidified extract, and treatment of the distillate with Mg; thereafter tests for  $\text{CH}_2\text{O}$  (e.g., morphine- $\text{H}_2\text{SO}_4$ ) are applied. F. O. H.

**Hydrocyanic acid and glucose.** F. DOMENICI (Boll. Soc. ital. Biol. sperim., 1936, 11, 689—691).—Hyperglycæmia induced by subcutaneous injection of glucose or pancreatectomy delays the death of rabbits or dogs due to administration of min. lethal doses of KCN. Addition of small amounts of KCN to blood *in vivo* or to defibrinated blood significantly increases the reducing power (Hagedorn-Jensen method). F. O. H.

**Ocular lesions resulting from thallium acetate poisoning.** C. M. SWAB (Arch. Ophthalmol., 1934, 12, 547—561).—Rodents had higher tolerance than dogs. CH. ABS. (*p*)

**Poisoning by sodium bismuth tartrate injections.** J. H. DOWDS (Lancet, 1936, 231, 1039—1040).—A record of three fatal cases. L. S. T.

**Toxicity to fowls of sodium arsenite and poisoned locusts.** J. K. CHORLEY (Rhodesia Agric. J., 1935, 32, 322—326).—The min. lethal dose of  $\text{As}_2\text{O}_3$  (as  $\text{Na}_2\text{HAsO}_3$ ) is 0.5—0.7 grain. A cock receiving 0.3 and 0.6 grain of  $\text{As}_2\text{O}_3$  daily in poisoned locusts showed beneficial effects, the As being gradually excreted in fæces. CH. ABS. (*p*)

**Arsenic content of hair etc. from industrial sources.** L. SCHWARZ and W. DECKERT (Arch. Hyg. Bakt., 1936, 115, 268—271).—In cases of mild As poisoning from drinking As-contaminated wine, finger-nails contained 4—20 and hair  $14\text{—}108 \times 10^{-6}$  g. of As per g. Urine contained  $4\text{—}116 \times 10^{-6}$  g. per litre. Hair of workers in a lead shot factory contained  $11\text{—}26 \times 10^{-6}$  g. of As per g. Workers exposed to an atm. containing As gave  $16.3 \times 10^{-6}$  g. of As per g. in the liver and  $1.36 \times 10^{-6}$  g. per g. in muscle. W. L. D.

**Elimination of arsenic as a function of the dose. I. Inorganic compounds.** G. ORESTANO and M. ABBATE (Boll. Soc. ital. Biol. sperim., 1936, 11, 660—662).— $\text{As}_2\text{O}_3$ , intravenously injected into rabbits, is excreted within 2—3 days to the extent of <40 and 40—60% (as As) with doses of <2 and 2—4.3 mg. per kg., respectively.  $\text{Na}_2\text{HAsO}_4$  is excreted within 1—2 days to the extent of 20—40 and 40—60% with doses of 1.5—3 and 3.8—7.5 mg. per kg., respectively. F. O. H.

**Mode of [pharmacological] action of arsenic trihydride.** K. WOLFF (Biochem. Z., 1936, 288, 79—92).—Hæmoglobin (I) and serum absorb  $\text{AsH}_3$  in proportion to their protein content and to an extent > does 0.9% NaCl. In presence of  $\text{O}_2$ ,  $\text{AsH}_3$  D (A., III.)

is catalytically oxidised by (I) ( $\text{AsH}_3\text{O}$ , which possibly causes the concomitant hæmolysis, being an intermediary), (I) being simultaneously decomposed, probably to hæmatin.  $\text{AsH}_3$  reduces methæmoglobin to (I). F. O. H.

**Importance of synthetic organic catalysts for the theory of enzyme action.** W. LANGENBECK (Chem.-Ztg., 1936, 60, 953—955).—A review.

**Maintenance and origin of optical activity in nature.** W. LANGENBECK and G. TRIEM (Z. physikal. Chem., 1936, 177, 401—408).—Experiments on the formation of *l*-menthyl oxalate from  $(\text{COCl})_2$  and menthol and of *l*-tyrosine anhydride from *l*-tyrosine Me ester have confirmed the theoretical deduction that if two substances, each optically impure, i.e., a mixture of stereoisomerides, enter with each other into a reaction which is prevented from going to completion the resultant will be optically purer than the reactants, i.e., will be further from being a racemic mixture. This seems to be the only generally possible way in which optical purity can increase in the cell. The result will be similar when an optically impure enzyme brings about the incomplete reaction of an optically impure substrate, a reaction which must be of the same type as those in which enzymes themselves are formed. R. C.

**Conductometric determination of enzyme activity.** B. N. SASTRI and M. SREENIVASAYA (Ind. Eng. Chem. [Anal.], 1936, 8, 458—459).—The activities of preps. of urease, arginase, trypsin, and emulsin determined conductometrically and chemically agree well except in the case of emulsin, with which only small changes in conductivity occur as hydrolysis proceeds. J. L. D.

**Liver xanthine oxidase.** E. A. H. ROBERTS (Biochem. J., 1936, 30, 2166—2176).—The observed rate of self-respiration of minced liver is due mainly to purine base (I) oxidation and is controlled by the rate of formation of (I) by nucleosidase. MeCHO does not accelerate O uptake and inhibits  $\text{CO}_2$  output of minced liver. The kinetics of oxidation of MeCHO is measured manometrically, a correction being made for the non-enzymic autoxidation of MeCHO on the KOH surface. EtCHO and to a smaller extent MeCHO destroy the oxidising enzyme. Liver xanthine (II) oxidase contains sufficient catalase (III) to protect it against  $\text{H}_2\text{O}_2$ . CN' inhibits (II) oxidation indirectly by poisoning (III). Aerobically a mixture of (II) and EtCHO is oxidised at the same rate as (II) alone. P. W. C.

**Ascorbic acid oxidase from drumstick, *Moringa pterygosperma*.** M. SRINIVASAN (Biochem. J., 1936, 30, 2077—2084).—A detailed account of work previously summarised (A., 1936, 893). P. W. C.

**Malic dehydrogenase of animal tissues.** D. E. GREEN (Biochem. J., 1936, 30, 2095—2110).—Malic dehydrogenase (I), from pig's heart muscle, is inactivated by small concns. (0.001*M*) of the oxidation product, oxaloacetic acid (II). This inhibition is removed by addition of ketonic reagents, the best being CN'. Besides (I), the catalytic system comprises co-enzyme I, carrier, and malate; as carriers methyl-

ene-blue, pyocyanine, lactoflavin, and adrenaline are the most effective. The system specifically oxidises *l*(-)-malic acid. The so-called fumaric dehydrogenase of Szent-Gyorgyi *et al.* (A., 1935, 1406) consists of (I) and fumarase together. (I) is not identical with the lactic enzyme. Fumaric acid can dismute anaerobically, forming (II) and succinic acid.

F. A. A.

**Amino-acid dehydrogenases in germinating seedlings.** M. DAMODARAN and K. R. NAIR (Current Sci., 1936, 5, 134).—Determination of dehydrogenase activity in two-day old seedlings, using Thunberg's technique with *l*(+)-alanine, *l*(+)-glutamic acid, glycine, *l*(-)-leucine, *l*(-)-histidine, *l*(-)-tyrosine, and *l*(-)-aspartic acid as substrates, shows that only the first two accelerate the reduction of methylene-blue.

F. N. W.

**Catalase activation in living cells.** K. YAMAFUJI (Biochem. Z., 1936, 288, 145—148).—The addition of  $H_2O_2$  to yeast emulsions, living yeast (*S. colliculosa*), or silkworm egg preps. increases the catalase activity. This probably explains the similar effect of ultra-violet irradiation (A., 1936, 1296).

F. O. H.

**Ionic effects, catalase activity, and the function of [plant] cells.** F. BOAS (Angew. Bot., 1936, 18, 13—16).—The action of anions in increasing catalase activity is in the order  $SO_4^{''} > PO_4^{'''} > Cl' > NO_3'$ . The physiological significance of  $SO_4^{''}$  is considered.

A. G. P.

**Properties of catalase hæmatin.** D. KEILIN and E. F. HARTREE (Proc. Roy. Soc., 1936, B, 121, 173—191).—Catalase (I) preps. show the characteristic absorption spectrum of a hæmatin compound (bands at 629.5, 544, 506.5  $m\mu$ ). It is shown spectrographically that the (I)-hæmatin combines with the agents which affect the catalytic activity of the enzyme or which form reversible compounds with methæmoglobin. Slow addition of  $H_2O_2$ , or of other peroxides, to azide- or  $NH_2OH$ -(I) changes its colour from greenish-brown to red (bands at 590 and 554  $m\mu$ ). The compounds so formed combine with  $CO$ , are oxidised by  $O_2$ , and are  $Fe^{II}$  derivatives. (I) inhibitors belong to two classes, (a) those like  $H_2S$  and  $KCN$ , which prevent the formation of an intermediate reduced compound, (b) those like azide,  $NH_2OH$ , and  $N_2H_4$ , which stabilise the intermediate compound.

F. A. A.

**Oximes and their inhibition of catalase action.** I. M. G. SEVAG and L. MARWEG (Biochem. Z., 1936, 288, 41—69).—The inhibitory action on blood-catalase of diacetyl-di- (I) and -mon-oxime, acetaldoxime, and cyclohexane-1 : 2-dionedioxime (II) induced by pretreatment with acid (A., 1934, 1136) is dependent on  $p_H$  and presence of  $H_2O$  (e.g., dry  $HCl$  is ineffective) but independent of acid concn., is more rapid at 91° than at 22°, and is not diminished by subsequent neutralisation. Treated oximes have an inhibitory action > that of  $KCN$ , the inhibition being related to the presence of one or more  $N\cdot OH$  but not to stereo-isomeric configuration. The inhibition of the decomp. of  $H_2O_2$  by catalase at 3° is > that at 37°. The inhibitory oximes have a marked catalytic and stabilising influence on each other. Acid-treated (II) can

revert to its original form.  $NH_2OH$  and  $Ac_2O$  (2 : 1 mol.) do not react as free substances in solution but form an additive product which acquires inhibitory activity on acid treatment. Excess of  $Ac_2O$  causes acid-treated (I) and (II) to lose both the inhibitory activity and the property of forming  $Ni$  complexes. It is concluded that the active form produced by acid treatment is due to the rearrangement  $\cdot CR\cdot N\cdot OH \rightarrow \cdot CR\cdot NH\cdot O$ .

F. O. H.

**Stereochemical problem of enzymic equilibrium. The fumarase system.** K. P. JACOBSON and J. TAPADINHAS (Bull. Soc. Chim. biol., 1936, 18, 1674—1680).—Using *dl*-malate (I) as substrate for fumarase, the equilibrium of the system is not defined by the const.  $K_T = [l\text{-(I)}]/[\text{fumarate (II)}]$ . A displacement of equilibrium in favour of *l*-(I) occurs in presence of the antipode. Also the velocity of conversion of *l*-(I) into (II) is inhibited by the presence of the antipode. The enzyme probably possesses an affinity for *d*-(I) but cannot convert it into (II).

P. W. C.

**Placental enzymes: fumarase.** D. P. DA CUNHA and K. P. JACOBSON (Compt. rend. Soc. Biol., 1936, 123, 609—611).—Placenta, washed free from blood, contains fumarase and is probably the source of the latter in foetal blood.

H. G. R.

**Biochemical synthesis of organic sulphur compounds.** F. B. PEREIRA (Compt. rend. Soc. Biol., 1936, 123, 620—621).—An org. S compound is formed if  $H_2S$  is added to *l*-malate in presence of fumarase.

H. G. R.

**Effect of halogen salts on salivary and pancreatic amylase.** W. M. CLIFFORD (Biochem. J., 1936, 30, 2049—2053).—Chlorides, bromides, and iodides of  $Li$ ,  $Na$ ,  $K$ ,  $NH_4$ ,  $Mg$ ,  $Ca$ , and  $Ba$  accelerate hydrolysis of starch by pancreatic and salivary amylases, the relative potencies being in the order  $Cl' > Br' > I'$ .  $Ba$  halides are least potent.  $NaF$ ,  $KF$ , and  $NH_4F$  do not accelerate amylolysis, which is inhibited by higher concns. of  $KF$ ,  $NH_4F$ ,  $LiI$ ,  $NH_4I$ ,  $MgI_2$ , and  $CaI_2$ .

P. W. C.

**Hormones and enzymes. I. Influence of certain hormones on amylase.** L. E. ROZENFELD and T. P. SCHESTERIKOVA (Ukrain. Biochem. J., 1936, 9, 741—749).—Adrenaline (I), insulin (II), and thyroxine (III) have no action on amylase *in vitro*. In the isolated liver, (II) and (III) have no action, but (I) has a slight activating effect. *In vivo*, (I) and (II), but not (III), produce activation.

F. A. A.

**Enzymic hydrolysis of some  $\beta$ -glucosides of tertiary alcohols.** S. VEIBEL and H. LILLELUND (Compt. rend., 1936, 203, 692—694; cf. A., 1936, 1297).—Amylene hydrate  $\beta$ -*d*-glucoside, m.p. 127—128° [ $\alpha$ ]<sub>D</sub> -17.90°, methyl-diethylcarbinol  $\beta$ -*d*-glucoside, m.p. 110—111°, [ $\alpha$ ]<sub>D</sub><sup>20</sup> -16.95°, and triethylcarbinol  $\beta$ -*d*-glucoside (I), m.p. 96.5—97.5°, [ $\alpha$ ]<sub>D</sub><sup>20</sup> -13.44°, on hydrolysis by emulsin give vals. of 0.49, 5.1, and 2.2 (mean), respectively, for  $k \times 10^4$ . With (I) there is a steady fall in the coeff. due to the great affinity of the carbinol for emulsin. Comparison with other glucosides shows that the rate of hydrolysis is small if the C carrying the glucoside linking is also united to three identical groups of atoms.

J. N. A.

**Preparation of the A-protein of fermentation enzyme.** E. NEGELEIN (Biochem. Z., 1936, 287, 329—333).—The prep. of the A-protein from Lebedev's maceration extract is described. The activity of the protein is lost on drying, slowly decreases in aq. solution at  $p_H$  6.8 and  $0^\circ$ , and rapidly decreases at  $p_H < 6$  and at  $p_H$  7.8. The protein is stable in half-saturated aq.  $(NH_4)_2SO_4$ . P. W. C.

**Oxidation of the Robison ester by triphosphopyridine nucleotide.** O. WARBURG and W. CHRISTIAN (Biochem. Z., 1936, 287, 440—441).—Triphosphopyridine nucleotide combined with the carrier protein of yeast oxidises the Robison ester to phosphohexonic acid. The oxidation in presence of other yeast proteins is more extensive, as indicated by  $O_2$  uptake and  $CO_2$  output. P. W. C.

**Lactoflavin as co-enzyme; active substance and carrier.** R. KUHN and H. RUDY (Ber., 1936, 69, [B], 2557—2567).—The rate of absorption of  $O_2$  by the system, Neuberg ester-co-enzyme from blood cells—intermediate enzyme from yeast, in presence of a const. amount of colloidal carrier (I) attains a max. in the presence of 0.64% of lactoflavinphosphoric acid (II). Absorption is scarcely noticeable in presence of an equiv. amount of lactoflavin (III) but the rate increases with further addition and finally approximates to that given by (II). Cryst. (III) from yeast or milk and synthetic (III) behave identically so that catalytic activity cannot be ascribed to traces of impurity. In absence of (I), (III) is practically without action. The change is controlled by the equilibria,  $(III) + (I) \rightleftharpoons (III) \cdots (I)$  which in dil. neutral solution of equiv. amounts is displaced almost completely towards the left, and  $(II) + (I) \rightleftharpoons$  yellow enzyme (IV) which in neutral solution lies completely towards the right. The difference in co-enzyme action of (II) and (III) is therefore purely quant. 6 : 7-Dimethyl-9-*l*- but not -9-*d*-araboflavin gives a readily dissociable, catalytically active protein compound. 3 : 6 : 7-Trimethyl-9-*d*-riboflavin and its 5'-phosphoric acid are inactive. Formation of a flavin enzyme is possible only if  $NH_3$  is free; replacement of NH by NMe renders all flavins incapable of forming non-fluorescent alkali salts and non-fluorescent, catalytically-active protein compounds. Next in importance are the structure of the side-chain at 9 and the stereochemical arrangement of the OH groups. Only those yield flavin-enzymes which contain  $OH_{(9)}$  on the left of the formula as usually written. Acetylation of all OH groups nullifies co-enzyme action completely. The flavin-9-glucosides, corresponding with the nucleosides, do not yield flavin-enzymes.  $Me_{(6)}$  and  $Me_{(7)}$  may not be absent simultaneously. If the above conditions are fulfilled, esterification with  $H_3PO_4$  is not essential for the development of catalytic activity but is important for the retention of pigment by carrier. Comparison of the results obtained in the above test with those of the growth tests on animals shows a close parallelism except with regard to the effect of acetylation. It may therefore be very useful for orientation purposes since very probably catalytically inactive flavins are also biologically inactive. The structure of (IV) is discussed. H. W.

**Highly purified cozymase.** H. VON EULER, H. ALBERS, E. ALBERS, F. SCHLENK, and G. GUNTHER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 4, 1—6).—Highly purified cryst. preps. of cozymase are obtained by fractional pptn. with EtOH. E. A. H. R.

**Phosphorylation of cozymase.** D. M. NEEDHAM (Compt. rend., 1936, 203, 615—616; cf. A., 1935, 1278).—Cozymase, free from adenylic acid, is not deaminated by muscle extracts and when added to extracts of rabbit muscle forms pyrophosphate more slowly than does adenylic acid. It is phosphorylated probably by phosphopyruvic acid. J. L. D.

**Binding of cozymase [to colloidal carriers] and a fermentation inhibitor present in yeast.** H. VON EULER and E. ADLER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 5, 1—6).—Evidence for the binding of cozymase to various dehydrogenases is afforded by its slower rate of dialysis in the presence of a lactic dehydrogenase solution prepared from top yeast. This solution contains a thermolabile fermentation inhibitor which was also found in an autolysate of bottom yeast. E. A. H. R.

**Participation of adenosine triphosphate in the enzymic dehydrogenation of hexoses.** H. VON EULER and E. ADLER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 6, 1—6).—The complete hexose monophosphate dehydrogenase system is able, in the presence of adenosine triphosphate, to oxidise both fructose and glucose. E. A. H. R.

**Pyridine, the hydrogen-transporting constituent of fermentation enzymes. (Pyridine nucleotides.)** O. WARBURG and W. CHRISTIAN (Biochem. Z., 1936, 287, 291—328).—The co-enzyme of fermentation consists of a phosphorylation co-enzyme (I) (the adenosinetriphosphoric acid of Lohmann or the diadenosinepentaphosphoric acid of Ostern) together with Euler's cozymase (II) (now shown to be not adenine nucleotide but a dinucleotide containing adenine and nicotinamide (IV) and now called diphosphopyridine nucleotide) and a similar H-transporting co-enzyme now called triphosphopyridine nucleotide (III). Methods are given for the isolation of (I), (II), and (III) from horse erythrocytes, for the isolation of (IV) from (II) and (III), and for its determination. The hydrogenation and dehydrogenation of (II) and (III) is determined in terms of ultra-violet absorption, the dihydropyridine band appearing on reduction and disappearing on oxidation. (II) and (III) contain respectively 18.3 and 16.6% of adenine, 17.6 and 15.6% of (IV), 8.9 and 12.1% of P, and 2 and 3 mols. of  $H_3PO_4$  per mol. of (IV). (IV) itself on isolation from (II) and (III) is not, but the related trigonelline and the methiodide of (IV) are, reversibly hydrogenated as with (II) and (III). In the hydrogenation of (II) and (III) with  $Na_2S_2O_4$  and of their protein compounds with carbohydrates, identical absorption spectra are obtained, carbohydrate thus converting the (IV) of (II) and (III) into the dihydronicotinamide. P. W. C.

**Choline-esterase in invertebrates.** C. S. KOSCHTOJANTZ (Ukrain. Biochem. J., 1936, 9, 665—670).—The hæmolymph of molluscs (snail, mussel, anodonta) contains a choline-esterase (I) capable of

rapidly decomposing acetylcholine. (I) is unstable in air, losing all activity in 24 hr. The hæmolymph of fresh- $H_2O$  crabs does not contain (I). F. A. A.

**Asymmetric hydrolysis of esters by enzymes.** X. Configuration specificity of component-esterase. Natural synthesis and artificial synthesis by enzymes. E. BAMANN and C. FEICHTNER (Biochem. Z., 1936, 288, 70—78; cf. A., 1934, 694).—The action of liver-esterase and pancreas-lipase, alone or admixed, on the synthesis of Me butyrate and the optical specificity of the enzymes in their action on Et mandelate do not confirm the hypothesis of Kraut and von Pantschenko-Jurewicz (A., 1935, 251). F. O. H.

**Conditions of action and specificity of Ricinus lipase.** L. REICHEL and W. REINMUTH (Z. physiol. Chem., 1936, 244, 78—80).—The lipase (I) hydrolyses triolein (II) most effectively at  $p_H$  4.7—5.0 and with (II) concn. of 0.0031M, the degree of hydrolysis being independent of the (I) concn. At  $p_H$  4.9 (I) is destroyed at 45—50°. (I) does not hydrolyse Ph salicylate, *p*-hydroxybenzoyl-*p*-hydroxybenzoic acid, or cholesteryl benzoate, oleate, or stearate. W. McC.

**Biological splitting of conjugated bile acids.** M. FRANKEL (Biochem. J., 1936, 30, 2111—2116).—Histozone from dog liver is capable of splitting hippuric acid, but not the conjugated bile acids (I). Ox liver does not give an enzyme capable of splitting either. Soil, human and dog intestines, and human faeces contain bacteria which can be grown on, and which split, (I). These bacteria grow *in vitro* at 25°, and not at 37°, but split (I) at 37°. F. A. A.

**Enzymic hydrolysis of lactalbumin.** L. MILLER and H. O. CALVERY (J. Biol. Chem., 1936, 116, 393—408).—Rapid hydrolysis of lactalbumin by pepsin occurs during the first 4 hr., after which the rate progressively decreases. Further digestion liberates with trypsin-kinase 7.8, protaminase 9—10, aminopolypeptidase 16.0, and dipeptidases 29—40% of the total N. Max. enzymic hydrolysis (68%) was obtained by pepsin followed by pancreatic extract. The N liberated was mainly  $NH_2$ - and not  $NH-N$ . P. G. M.

**Proteolytic digestion and the problem of the pancreas in the ammocoete larva of Lampetra planeri.** E. J. W. BARRINGTON (Proc. Roy. Soc., 1936, B, 121, 221—232).—A proteolytic enzyme (I) of the tryptic type is found at the anterior end (which contains zymogen cells) of the intestine of the ammocoete. The  $p_H$  optimum of (I) is between 7.5 and 7.8, but it has some activity in more acid solutions. The pancreas-like organ of these larvæ is not essential for the production of (I). F. A. A.

**Proteinase of fibrin.** A. SCHMITZ (Z. physiol. Chem., 1936, 244, 89—98).—The dissolution of fibrin in salt solutions (fibrinolysis) is a proteolytic process caused by a trypsin-like proteinase (I) and a kinase (II) which are destroyed by heating for 1 hr. at 60° and are not ultrafilterable. (I) is separated from fibrin by extraction with 0.1N-AcOH and (II) is separated after removal of (I) by extraction with 0.1N- $Na_2CO_3$ . Some proteins are attacked by (I) alone, some only by (I)+(II), (II) increasing the effect

of (I) in every case. Tripeptides are not attacked by (I) or (I)+(II). (II) probably acts by removing inhibitors. W. McC.

**Nephelometric micro-determinations of antitryptic activity.** C. WUNDERLY (Mikrochem., 1936, 21, 88—97).—0.4 c.c. of trypsin solution (0.1 or 0.01%), 0.5 c.c. of casein solution (0.25% in 0.006N-NaOH), 0.5 c.c. of *M*/15 buffer solution ( $p_H$  8.14), and 0.4 c.c. of blood solution (5% of serum in 0.9% aq. NaCl) are mixed and kept at 37° and after known periods 0.3 c.c. is withdrawn, and mixed with 0.6 c.c. of 25% HCl and 0.1 c.c. of  $H_2O$  to stop further action; 0.3 c.c. of 20% aq. sulphosalicylic acid is then added and after 15 min. the solution is tested for turbidity. The difference between the results obtained for two different periods and for corresponding measurements with 0.9% aq. NaCl controls indicates the antitryptic titre. J. W. S.

**Proteinases in tissues of chick embryo.** B. GOLDSCHTEIN and M. GINTZBURG (Ukrain. Biochem. J., 1936, 9, 593—602).—The catheptic action on gelatin of glycerol extracts of egg-yolk and embryonic membranes appears on the 9th day of incubation and rapidly reaches a max. and const. val. The difference between the amounts of  $H_2S$ -activated and  $H_2S$ -non-activated cathepsin is high, especially in the early period. The behaviour is similar to that of placenta-cathepsin. F. A. A.

**Modification of cathepsin in autolysis of muscular tissue.** I. A. SMORODINCEV and N. V. NICOLAEVA (Compt. rend. Acad. Sci. U.R.S.S., 1936, 3, 375—377).—During autolysis of beef at 1° to -4°, the activity of the cathepsin (I) decreases by 40—55% in the first 24 hr. During 5 days, there is a further diminution of 20%. Activation by  $H_2S$  doubles the activity of (I). The stabilisation of the proteins at the end of 24 hr. is due to the decrease in activity of (I). J. N. A.

**Phosphatase activity of emulsin.** H. BREDE-RECK, H. BEUCHELT and G. RICHTER (Z. physiol. Chem., 1936, 244, 102—104).—Sweet almond emulsin (I) contains a phosphatase (II) which hydrolyses guanylic, cytidylic, uridylic, yeast-adenylic and -nucleic, and thymus-nucleic acids, the optimum  $p_H$  being 4.5—5.5. The (II) content of (I) remains approx. const. when the  $\beta$ -glucosidase content varies greatly. The action of (II) is inhibited by NaF but is scarcely affected by  $Na_3AsO_4$ . W. McC.

**Plant phosphatases. I. Phosphatase of Aspergillus oryzae, a mixture of isodynamic phosphoesterases.** E. BAMANN and W. SALZER (Biochem. Z., 1936, 287, 380—399).—Various samples of takaphosphatase in citrate buffer showed max. hydrolysis of both  $\alpha$ - and  $\beta$ -glycerophosphoric acid (I) at  $p_H$  4.1. When such solutions are adjusted to, and kept for 0.5 hr. at,  $p_H$  8—8.2, selective inactivation of one phosphatase occurs and the resulting solution shows max. activity at  $p_H$  6.2 which is now independent of the presence of citrate. The enzyme of optimum  $p_H$  4.1 attacks  $\alpha$ -(I) and of optimum  $p_H$  6.2  $\beta$ -(I) more rapidly. Commercial enzymes probably contain varying amounts of these two phosphatases. They also contain a difficultly dialysable

substance which inhibits the phosphatases and also a readily dialysable anti-inhibiting substance which resembles in its action and can be replaced by citrate ions. F' inhibits the phosphatase of optimum  $p_H$  4.1 without seriously inhibiting that of  $p_H$  6.2, the solution then attacking  $\alpha$ -(I) preferentially. Neither phosphatase is activated by  $Mg^{++}$  using either citrate or veronal buffer.

P. W. C.

**Yeast phosphatases.** H. ALBERS and E. ALBERS (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 3, 1—6).—A yeast phosphatase (I), with a  $p_H$  optimum of 3.5 and inhibited by  $Mg^{++}$ , which acts on  $\beta$ -glycerophosphate and hexose diphosphate, is described and the name hexosediphosphatase suggested for it. (I) remains attached to the cellular residue after autolysis, and is obtained in solution by digestion of the residue with dried green malt. Dialysis of (I), despite a rapid removal of  $Mg^{++}$  and  $PO_4^{+++}$ , causes at first no diminution of activity, but after a given time the activity decreases progressively to a const. end val., which is not enhanced by addition of the dialysate.

E. A. H. R.

**Effect of methods of preparation on the fermentative activity of yeast zymen.** E. I. FULMER and K. G. DYKSTRA (Proc. Soc. Exp. Biol. Med., 1936, 33, 492—494).—The activity of the zymen is increased by storage of the yeast at 5° for 14 days (no activity after 20 days) and by drying at room temp. in a vac. instead of at 45°. The increases are correlated with increased esterification of inorg.  $PO_4^{+++}$  in presence of glucose.

W. McC.

**Autolysis of cultured yeasts.** B. DREWS (Biochem. Z., 1936, 288, 207—237).—The press-juice from various types of brewer's, baker's, and press-yeast has  $p_H$  5.41—6.04, the val. being influenced by the  $CO_2$  content. The proteolytic activity of the yeast, which is dependent on the conditions of growth, exhibits a latent period related to the self-fermentative action; thus a glycogen-free yeast showing no self-fermentation has no latent period of proteolysis. Poly- and di-peptidase activity is  $>$  that of proteinase. Storage of yeast at low temp. decreases the  $[H^+]$  of the resultant press-juice but storage at higher temp. has the opposite effect due to increased proteolysis. The various yeasts differ in their optimum  $p_H$  (between 4.25 and 5.0) for proteinase action; these  $p_H$  vals. depend on the nature of the protein substrate. The  $p_H$  optima indicated by  $CH_2O$  titration or solubility of N are approx. coincident at 7.4—7.6 and indicate a peptidase. Changes in  $p_H$  during the course of hydrolysis and the correlation between  $p_H$  optima of autolysis and stability of the yeasts are discussed.

F. O. H.

**Top yeast.** H. VON EULER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 11, 1—4).—A discussion of the quant. differences in top and bottom yeasts. The term ergone is suggested for cellular activators (hormones, vitamins, etc.) in general. A substance of enzymic character where the ergone is the prosthetic group is called an ergozyme and the protein carrier a zyme.

E. A. H. R.

**Processes in the synthesis of yeast-substance and the possible yields in yeast cultivation.** R. LECHNER (Z. Spiritusind., 1936, 59, 391—392, 399—

400).—Theories as to the mode of synthesis of nitrogenous and non-nitrogenous components of the yeast cell are outlined and critically reviewed, with especial reference to the work of Effront and Claassen and the max. theoretical yields when yeast is cultivated on nutrient solutions.

I. A. P.

**Biological protein synthesis.** H. LÜERS and E. MÖRIKE (Z. Spiritusind., 1936, 59, 383—384, 386—387).—Of several micro-organisms tried *Torula utilis* is most suitable for protein synthesis from both glucose and wood-sugar wort. The traces of org. N in the latter have a growth-promoting effect. Addition of org. N often increases the yield.

E. A. H. R.

**Action of morphine on the respiration of *Saccharomyces ellipsoideus* in absence or presence of extract of thymus gland.** P. MASOHERPA (Boll. Soc. ital. Biol. sperim., 1936, 11, 682—683).—The addition of 0.02—0.1% of morphine to cultures of *S. ellipsoideus* reduces the  $O_2$  consumption by 30—60%, the effect not being significantly modified by presence of thymus extracts.

F. O. H.

**Influence of carbon monoxide on the respiration of the yeast cell in different media.** Physiology of fertilisation. Å. ÖRSTROM (Protoplasma, 1935, 24, 177—185).—The respiration of unfertilised sea-urchin eggs is increased, and that of fertilised eggs is decreased, by CO. Respiration of yeast cells alone and in presence of formate is increased by CO, and in presence of  $AcCO_2Na$ , Na lactate,  $NaOAc$ ,  $MeCHO$ , and  $EtOH$  is decreased, giving inhibition curves similar to those of the fertilised eggs, but characteristic of each substrate and each concn. KCN produced the same effects as CO. Different substrates are probably oxidised during respiration before and after fertilisation of the eggs.

M. A. B.

**Intermediate products in the fermentation of maltose.** H. WINBERG and K. M. BRANDT (Svensk Kem. Tidskr., 1936, 48, 213—221).—The phosphorylation of maltose and glucose and the decomp. of the esters formed have been studied without any definite conclusions being reached.

M. H. M. A.

**Production of bacterial growth stimulants by yeast.** L. H. PULKKI (Ann. Acad. Sci. Fenn., 1935, 41, No. 1, 132 pp.; Chem. Zentr., 1936, i, 1038).—Yeast synthesises a thermostable substance stimulating the growth of *B. mycoides*. It is not an ash constituent and does not pass into extracts of living yeast cells, but is obtained from heat-killed yeast preferably by extraction with 0.025M- $PO_4^{+++}$  buffer of neutral or slightly alkaline reaction. Max. activity occurs in extracts of yeast cultures 4—8 days old. Production of the stimulant is optimum in cultures of  $p_H$  7.0, is influenced by the amount but not by the nature of the N source, is diminished by aeration of the culture, but is unaffected by temp. or exposure to ultra-violet light.

A. G. P.

**Physiology of dry rot (*Merulius lacrymans domesticus*, Falck).** R. GISTL (Arch. Mikrobiol., 1936, 7, 177—187).— $NO_3^-$  is superior to  $NH_4^+$  as N-source for the organism.  $PO_4^{+++}$  produces long mycelial growth without increasing the total yield. Ca and Mg in small concns. favour and in larger proportions

inhibit growth. Aq. extracts of mycelium contain relatively large amounts of the cell-division growth-substance which promotes rapid increase in yeast growth.

A. G. P.

Effects of heavy metals essential for the nutrition of *Aspergillus niger* on its growth. R. A. STEINBERG (Amer. J. Bot., 1936, 23, 227—231).—Effects of Fe, Zn, Mn, and Cu are examined. The optimum concns. of metals for growth of the mould are higher in more alkaline media ( $p_H > 8.0$ ).

A. G. P.

Effects of barium salts on *Aspergillus niger* and their bearing on the sulphur and zinc metabolism of the fungus in an optimal solution. R. A. STEINBERG (Bot. Gaz., 1936, 97, 666—671).—With nutrient media containing Cu, Fe, Zn, and Mn addition of  $H_2SO_4$ ,  $Na_2SO_4$ , or  $Na_2S$  increased the growth of the mould. Ba has little direct toxic action, but by partial pptn. of  $SO_4^{2-}$  and the resultant modification of physiological balance of the nutrient induces deficiency symptoms resembling those due to lack of N, P, Mg, Fe, or Zn.

A. G. P.

Preservation of strains of *Aspergillus niger*. T. PALEY (Arch. Mikrobiol., 1936, 7, 206—209).—Dry spores, stored for a year, retain their ability to produce citric acid.

A. G. P.

Lipase production by *Penicillium oxalicum* and *Aspergillus flavus*. D. KIRSH (Bot. Gaz., 1935, 97, 321—333).—The organisms produce a  $H_2O$ -sol. enzyme effecting hydrolysis of olive oil. Max. amounts occur at the period of complete sporulation. EtOH ppts. from extracts of *P. oxalicum* an enzyme containing 8.5 times the amount of lipase per unit of protease of a commercial high-lipase trypsin.

Determination of traces of arsenic in biological material with *Penicillium brevicaulis*. S. BREITER (Arch. Hyg. Bakt., 1936, 115, 291—302).—Growths of *P. brevicaulis* in bread cultures containing As were examined for amounts of  $CO_2$  evolved,  $KMnO_4$  oxidising val. and I absorption val. of other evolved gases. It was found impossible to determine As by this method.

W. L. D.

Hydrogen-ion concentration of media for mould culture. E. MASERA (Boll. sez. Ital., 1936, 8, 52—53).—Mould growth depends on the initial  $p_H$  of the media, the composition of the nutrients, yield of mould material, and the temp. of incubation. The effect on  $p_H$  of excreted material during vigorous growth is stressed.

W. L. D.

Origin of an earthy or muddy taint in fish. I. Nature and isolation of the taint. A. C. THAYSEN. II. Effect on fish of the taint produced by an odoriferous species of *Actinomyces*. A. C. THAYSEN and F. T. K. PENTELOW (Ann. Appl. Biol., 1936, 23, 99—104, 105—109).—I. The pungent "earthy" odour produced by certain *Actinomyces* is due to a brown amorphous org. substance, volatile in steam, sol. in  $Et_2O$ , slightly sol. in  $H_2O$  and in EtOH. Small amounts (2 p.p.m.) impart an earthy odour to  $H_2O$  especially if the latter is slightly alkaline. Pollution of salmon streams by such a substance is discussed.

II. Trout flesh becomes tainted by material pro-

duced by odoriferous *Actinomyces*. The taint is acquired via the gills, is carried in the blood stream, and can be eliminated by clean flowing  $H_2O$ .

A. G. P.

Chemistry of cell division. IV. Influence of hydrogen sulphide, hydrocyanic acid, carbon dioxide, and some other chemicals on mitosis in *Amoeba proteus*. C. VOEGTLIN and H. W. CHALKLEY (Protoplasma, 1935, 24, 365—383).— $H_2S$  and HCN caused reversible inhibition of mitosis, EtOH and  $CO_2$  incompletely reversible inhibition.  $H_2O_2$ ,  $As_2O_3$ , methylene-blue,  $CuCl_2$ , and  $HgCl_2$  were without influence, as also was CO in the absence of light and  $O_2$ .

M. A. B.

Protozoa in relation to narcosis. P. MAKAROV (Protoplasma, 1935, 24, 593—606).—Intra-vital staining and microscopical examination of protozoa treated with EtOH, urethane,  $CHCl_3$ , or  $Et_2O$  indicated that the action of narcotics depends on alterations in the colloidal state of the cell (decrease in dispersion) and in the adsorptive power of the living matter.

M. A. B.

Comparison of distribution of intestinal protozoa of Norway rat, wood rat, and guinea-pig with reference to hydrogen-ion concentration determined by the glass electrode. C. A. KOFOID, E. MCNEIL, and A. E. BONESTELL (Univ. Calif. Publ. Zool., 1935, 41, 1—8).

CH. ABS. (p)

Effect of aeration and  $CO_2$  lack on growth of bacteria-free cultures of protozoa. T. L. JAHN (Proc. Soc. Exp. Biol. Med., 1936, 33, 494—498).—Cultures of *Glaucoma piriformis* aerated with ordinary and  $CO_2$ -free air grew at the same rate as but less rapidly than did unaerated cultures. The rates of growth of cultures of *Chilomonas paramecium* form the series unaerated > aerated with ordinary air > aerated with  $CO_2$ -free air.

W. McC.

Comparative spectroanalytical investigation of *Cryptosporidium proliferum* and the mineral waters of Saratoga Springs, New York. O. BAUDISCH (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 9, 1—5).

E. A. H. R.

Carbarsone: action on *Trichomonas hominis* and on rat trichomonads *in vitro*. A. GABALDSON (Amer. J. Hyg., 1935, 22, 326—328).—0.30% solutions of carbarsone (*p*-carbamyphenylarsinic acid) are lethal to both organisms.

CH. ABS. (p)

Production of *d*- and *l*- $\alpha$ -hydroxy- $\gamma$ -methylthiolbutyric acids. Nutritive value of the acids. K. AKOBE (Z. physiol. Chem., 1936, 244, 14—18).—*Oidium lactis* converts *l*-methionine (I) into *d*- $\alpha$ -hydroxy- $\gamma$ -methylthiolbutyric acid (II) (Ba salt; Zn salt,  $[\alpha]_D +32.35^\circ$  in  $H_2O$ ), small amounts of MeSH and  $Et_2S$  (but no  $H_2SO_4$ ) being also produced. *B. subtilis* or  $Ba(NO_3)_2$  converts (I) into *l*- $\alpha$ -hydroxy- $\gamma$ -methylthiolbutyric acid (III) (Ba salt; Zn salt,  $[\alpha]_D -31.03^\circ$  in  $H_2O$ ). (II) and (III) stimulate growth in rats losing wt. on a diet poor in methionine and cystine.

W. McC.

Deamination of *l*-alanine. E. AUBEL and F. EGAMI (Bull. Soc. Chim. biol., 1936, 18, 1542—1550).—*l*-Alanine is deaminated by suspensions of soil

bacteria only in presence of  $O_2$  or  $NO_3'$  with the formation of  $NH_3$  and  $AcCO_2H$ , the greater velocity being obtained anaerobically in the presence of  $NO_3'$ . The action of  $NaF$ ,  $KCN$ ,  $PhMe$ , octyl alcohol, and phenylurethane on deamination in presence of  $O_2$  or  $NO_3'$  is comparable, suggesting an analogous mechanism. The mechanism of deamination is discussed (cf. A., 1936, 640). P. W. C.

**Soil micro-organisms and cationic absorption. Variations in the Ca/Mg ratio.** E. CASTELLANI (Boll. sez. Ital., 1936, 8, 56—59).—Inoculating sterile soil with a soil infusion and incubating for 16—20 weeks depressed the  $H_2O$ -sol. Ca/Mg ratio by 20% without glucose and raised it 9% with glucose in 16 weeks but with glucose the ratio decreased 35% in 20 weeks. The ratio of exchangeable Ca/Mg remained the same without glucose but decreased 20% with glucose. W. L. D.

**Effect of small quantities of agar on the growth and nitrogen fixation of *Azotobacter* and on other microbiological processes.** A. RIPPEL (Arch. Mikrobiol., 1936, 7, 210—234).—Addition of agar (0.05—0.1%) to nutrient media increased the growth of *Aspergillus*, the growth and N fixation of *Azotobacter*, and the production of glycine by intestinal bacteria. Neither the ash contents nor growth substances in agar are concerned in this action. The lowering of the surface tension of aq. media favours freer growth of moulds. The increased buoyancy of the agar medium facilitates the supply of  $O_2$  to *Azotobacter* as a result of colloidal absorption. Rapid fixation of N in soil is related to the presence of colloids therein. A. G. P.

**Biological oxidation of ammonia by nitrite formers.** G. G. RAO and K. M. PANDALAI (Arch. Mikrobiol., 1936, 7, 32—48).— $H_2O_2$  oxidises  $NH_3$  to  $NO_2'$  and  $NO_3'$  independently of the presence of Fe. Biological oxidation of  $NH_3$  probably does not involve a peroxide-peroxidase system, and  $NH_2OH$  is unlikely to be an intermediate product. Respiratory poisons (various cyanides) reversibly inhibit the oxidation system irrespective of the  $[Fe^{++}]$  of the substrate. Haematin and haemoglobin (0.0025%) inhibit the oxidation process by approx. 50%. Biological oxidation of  $NH_3$  is a surface catalytic action occurring at certain active centres on the bacterial cell. A. G. P.

**Detection of oxygen elimination in the assimilation process of *Thiorhodaceae*.** V. CZURDA (Arch. Mikrobiol., 1936, 7, 110—114).—Elimination of  $O_2$  in amounts > equiv. to S consumed is demonstrated in a special culture tube. A. G. P.

**Oxygen uptake of marine bacteria.** F. H. JOHNSON (J. Bact., 1936, 31, 547—556).—The  $O_2$  intake of a no. of species is examined, together with the influence thereon of glucose and Na alginate and of temp. changes. A. G. P.

**Utilisation of lactose by *Escherichia coli-mutabile*.** C. J. DEERE, A. D. DULANEY, and I. D. MICHELSON (J. Bact., 1936, 31, 625—633).—The A.O.A.C. method for determining lactose (I) gives accurate vals. for (I) broth without preliminary removal of nitrogenous material. The white form of

the organism utilises little or no (I) before (I)-fermenting variants are formed. In plain broth the red and white forms produce similar changes in  $p_H$  and  $NH_3$  content of the medium. In (I) broth the white strain produces more  $NH_3$ . The white form probably cannot utilise (I) but obtains its energy from N compounds in the medium. A. G. P.

**Dissociation and lactase activity in slow lactose-fermenting bacteria of intestinal origin.** A. D. HERSHEY and J. BRONFENBRENNER (J. Bact., 1936, 31, 453—464).—Organisms of the *B. coli-mutabile* type show stable metabolic characters distinct from *Escherichia coli*. Colonial dissociation occurs concomitantly with metabolic variation. Fermentation of lactose by the bacteria is a function of an intracellular lactase. A. G. P.

**Diversion of the normal heterolactic dissimilation by addition of hydrogen acceptors.** M. E. NELSON and C. H. WERKMAN (J. Bact., 1936, 31, 603—610).— $MeCHO$  and  $CHAcMeOH$  are readily hydrogenated when added to glucose cultures of *Lactobacillus lycopersici* and cause an increase in the  $AcOH$  and  $CO_2$  and a decrease in  $EtOH$ , lactic acid, and glycerol formed. A. G. P.

**Invisible parasite of lactic bacteria.** P. MAZÉ (Compt. rend. Soc. Biol., 1936, 123, 565—566).—The parasite is destroyed in 5—6 min. at 67° and appears to exist inside the organism. H. G. R.

**Respiration of propionic acid bacteria.** R. W. STONE, C. ERB, and C. H. WERKMAN (Proc. Soc. Exp. Biol. Med., 1936, 33, 483—484).—In the presence of resting  $EtCO_2H$  bacteria succinic (I) and to a smaller extent fumaric acid (II) donate H to methylene-blue and o-chlorophenol-indophenol and (I) donates H to  $NaNO_3$ . Malic acid (III) scarcely donates H to these acceptors. In buffered suspensions of the bacteria  $O_2$  uptake is marked when (I), lactic acid (IV), and  $AcCO_2H$  are the substrates and much less when (II) and (III) are the substrates. In  $N_2$  the bacteria liberate much  $CO_2$  from (I), (IV), and  $AcCO_2H$  and smaller amounts from (II) and (III). (I) is probably converted into  $EtCO_2H$  by direct decarboxylation. W. McC.

**Is vitamin- $B_2$  the accelerating factor in the fermentation of sugar by propionic acid organisms?** V. G. LAVA, R. ROSS, and K. C. BLANCHARD (Philippine J. Sci., 1936, 59, 493—504).—Substances stimulating the fermentation occur in the vitamin- $B_2$  fraction. A. G. P.

**Aerobic dissimilation of lactic acid by propionic acid bacteria.** C. ERB, H. G. WOOD, and C. H. WERKMAN (J. Bact., 1936, 31, 595—602).—The organisms utilise  $O_2$  in the dissimilation of lactic acid, optimum conditions for  $O_2$  intake being  $p_H$  5.3—5.6.  $AcCO_2H$  is among the products. A. G. P.

**Oxidation of glucose by *Bacterium gluconicum*, Hermann.** S. HERMANN and P. NEUSCHUL (Biochem. Z., 1936, 287, 400—404).—The amounts of gluconic acid (I) formed by *B. gluconicum* at 20° and 30° for various periods in solutions of 5—6% of glucose in yeast- $H_2O$  were determined. At 20°, the optimum initial sugar concn. was 20% and the yield

of (I) after 30 days was 72%, whereas at 30° the optimum concn. was 40% and the yield 51.6%. 50% sugar solutions were oxidised only at 30°, whilst with concns. >55%, no oxidation occurs.

P. W. C.

Acid production and protein degradation of some acid-proteolytic cocci. N. R. KNOWLES (J. Dairy Res., 1936, 7, 176—181).—The nature and extent of proteolysis in milk cultures of various organisms are examined.

A. G. P.

Analysis and synthesis of the lysogenic power of *B. megatherium*. A. GRATIA (Compt. rend. Soc. Biol., 1936, 123, 506—508).—The lysogenic power of certain species is an acquired characteristic.

H. G. R.

Conditions affecting production of toxin and porphyrins by diphtheria bacillus. M. W. WHEELER and M. O'L. CROWE (J. Bact., 1936, 31, 519—521).—Both toxin and porphyrins (I) occur in cultures grown in an atm. containing  $\leq 1\%$  each of  $O_2$  and  $CO_2$ ; with small concns. of  $O_2$  and  $CO_2$  growth continued but little or no toxin was produced. (I) had no influence on the toxigenic properties of either toxigenic or non-toxigenic strains but tended to increase pigment formation.

A. G. P.

Physiological role of the codehydrogenases for *Haemophilus parainfluenzae*. A. LVOV and M. LVOV (Compt. rend., 1936, 203, 896—899; cf. A., 1936, 1562).—These bacteria, deprived of the growth factor, only very slowly reduce methylene-blue or oxidise glucose and other substrates, but on addition of codehydrogenase (I) the rates are greatly increased. The oxidation of lactate and succinate is little affected by (I). On the addition of (I), an incubation period of 90—150 sec. is necessary, independent of the substrate. The bacteria appear to effect the reaction pyridine nucleotide diphosphate  $\rightleftharpoons$  triphosphate rapidly when supplied with (I), but to be less capable of effecting the reaction Warburg's co-enzyme  $\rightarrow$  cozymase. (I) appears to exist in the bacteria in both free and combined forms.

F. A. A.

Nutrition of *Staphylococcus aureus*. Necessity for uracil in anaerobic growth. G. M. RICHARDSON (Biochem. J., 1936, 30, 2184—2190).—A medium containing  $NH_4$ -acids,  $AcCO_2H$ , etc., which is sufficient for aerobic growth of *S. aureus*, requires also the addition of a "factor III" to permit anaerobic growth. Factor III is identified with uracil (I) since this alone of 21 pyrimidines and purines examined permitted anaerobic growth. The significance of this to the distribution and function of (I) in nature is briefly discussed.

P. W. C.

Experimental *Staphylococcus* food poisoning. Growth of a food-poisoning *Staphylococcus* and production of an enterotoxic substance in bread and meat. F. C. KELLY and G. M. DACK (Amer. J. Publ. Health, 1936, 26, 1077—1082).—In two human subjects severe food poisoning symptoms followed the ingestion of bread or meat containing approx.  $10^9$  organisms per g. of a "food-poisoning" strain of *Staphylococcus*. A third subject was unaffected. The organism thrived on meat containing

a concn. of salt sufficient to prevent the growth of rod forms.

E. C. S.

Action of aldehydes on certain cultures of *Streptococcus liquefaciens* in milk. B. W. HAMMER (J. Bact., 1936, 31, 479—487).—In milk cultures of *S. liquefaciens*,  $EtCHO$ ,  $Pr^iCHO$ , and  $Bu^iCHO$  as well as  $MeCHO$  increased the yield of  $CHAcMe\cdot OH$ . Homologues of  $Ac_2$  were not produced except possibly in the case of  $Bu^iCHO$ .  $CH_2O$  and furfuraldehyde did not affect the fermentation products.

A. G. P.

Phosphatide acid of human tubercle bacilli. K. BLOCH (Z. physiol. Chem., 1936, 244, 1—13; cf. A., 1936, 1028).—The P-containing lipin of human tubercle bacilli consists of the Mg salt of a N-free phosphatide acid (I) mixed with  $NH_4$  salts, a  $H_2O$ -sol. polysaccharide, and wax. After removal of the Mg with dil. HCl, conversion into Pb salt with  $Pb(OAc)_2$ , and removal of the Pb with dil. HCl, a dibasic diglycerophosphoric acid containing 3.8% of P is obtained. The wax, mol. wt. approx. 890, yields on hydrolysis the K salt of an acid identical with that obtained by Anderson (A., 1927, 1114). Bovine tubercle bacilli yield a phosphatide very similar to (I).

W. McC.

Physico-chemical problem of tuberculin. G. SANDOR (Ann. Inst. Pasteur, 1936, 57, 565—582).—Tuberculin (I) is not identical with the proteins of the tubercle bacillus. Its activity is independent of the denaturation of the proteins, and it can be dialysed through membranes impermeable to the proteins. (I) is not a member of the sugar group. In the living bacteria, (I) is associated with lipins, but is not itself a lipin, since during fractionation of  $EtOH-Et_2O$  extracts (I) loses its solubility in org. solvents and becomes  $H_2O$ -sol.

F. A. A.

Method for investigating electrophoresis [of bacterial cells]. L. S. MOYER (J. Bact., 1936, 31, 531—546).—Suitable apparatus is described and examples of its use are given.

A. G. P.

Production of protective proteinases after parenteral injection of killed bacteria. R. ABDERHALDEN (Fermentforsch., 1936, 15, 233—244).—Protective enzymes can be detected within 24 hr. of parenteral injection of killed bacilli whilst the Widal reaction gives a positive reaction much later. The production of protective enzymes is probably the first method of defence against infection elaborated by the body.

E. A. H. R.

Bacteriophage as related to the root nodule bacteria of lucerne. S. C. VANDECAVEYE and H. KATZNELSON (J. Bact., 1936, 31, 465—477).—A potent lytic principle against *R. meliloti* occurs in soils carrying lucerne for >3 years, and probably also in nodules. The phage is probably responsible for poor nodulation and growth of lucerne in certain cases.

A. G. P.

Bactericidal action of bacteriophage. V. SERTIC and N. A. BOULGAKOV (Compt. rend. Soc. Biol., 1936, 123, 778—779).—The bactericidal action is probably due to an enzyme secreted by the bacteriophage.

H. G. R.

Neurotropic virus of horse sickness. II. Physical and chemical properties. R. A. ALEX-

ANDER (Onderstepoort J. Vet. Sci., 1935, 4, 323—348).—The thermal death range was 55—60°. Suspensions were stable at  $p_H$  7—10 but were killed at 5.90—5.98. The viricidal action of PhOH and cresol varied with temp. and was influenced by the presence of Et<sub>2</sub>O. Et<sub>2</sub>O did not inactivate the virus. Methylene-blue had a photodynamic inactivating action.

CH. ABS. (*p*)

**Boric acid as a selective bacteriostatic agent.** E. M. M. BLAIR (J. Hyg., 1936, 36, 446—448).—0.5% H<sub>3</sub>BO<sub>3</sub> in lactose-peptone medium shows a marked selective action for bacterial growth in 24 hr. at 37°. Strains capable of growth are probably of faecal origin. With 1% Na<sub>2</sub>SO<sub>3</sub>, the growth of *B. coli* is not inhibited as is that of *B. lactis aerogenes*.

W. L. D.

**Bacteriostatic action of certain furan derivatives.** N. M. PHATAK and C. D. LEAKE (J. Pharm. Exp. Ther., 1936, 58, 155—158).—The variation in bacteriostatic action of certain furan derivatives is similar to that of the corresponding C<sub>6</sub>H<sub>6</sub> compounds.

E. M. W.

**Hexamine as a urinary antiseptic. I. Rate of hydrolysis at different hydrogen-ion concentrations. II. Antiseptic power against various bacteria in urine.** R. ST. A. HEATHCOTE (Brit. J. Urol., 1935, 7, 9—32).—The rate of hydrolysis of (CH<sub>2</sub>)<sub>6</sub>N<sub>4</sub> at 0.1—1.1° is largely controlled by the  $p_H$ , which is also an important factor at higher temp. Presence of neutral salts and of undissociated fractions of acid salts is also influential.

CH. ABS. (*p*)

**Influence of amino-acids on nutrient media and bacteria.** W. LOELE (Zentr. Bakt. Par., 1935, I, 135, 386—391).—In the presence of OH' phenols (notably *o*-phenols), H<sub>2</sub>O<sub>2</sub>, glucosides, many dyes, and alkaloids liberate NH<sub>3</sub> from NH<sub>2</sub>-acids, probably through the intermediate formation of aldehydes. Liberation of NH<sub>3</sub> from amines, N-containing phenols, and basic dyes by NaOH is depressed by addition of NH<sub>2</sub>-acids. The significance of these reactions on changes in bacterial cultures is indicated.

A. G. P.

**Rice bran extracts and the growth of micro-organisms.** R. W. DUNN and A. J. SALLE (J. Bact., 1936, 31, 505—516).—Rice bran contains substances (possibly including pantothenic acid) which stimulate carbohydrate fermentation by bacteria and yeasts. Aged extracts show diminished potency. Fresh extracts from fresh and from old bran affected bacteria similarly, but yeast was influenced only by extracts from fresh bran. With the possible exception of PO<sub>4</sub>''' all necessary nutrients for *E. coli* and other organisms are present in bran extracts.

A. G. P.

**Extract from silkworm pupae as a useful substitute for meat extract in the preparation of bacteriological culture media.** M. NUKADA (Philippine J. Sci., 1936, 60, 11—18).

E. A. H. R.

**Selective passage of hormones across the uterine epithelium.** D. S. ELEFTHÉRIOU (Compt. rend. Soc. Biol., 1936, 123, 231—233).—The epithelium can selectively absorb the hormone from aq. or oily solution.

H. G. R.

**Hormone action in the light of the protective proteinase reaction.** E. ABDERHALDEN and G. SHIMIDZU (Fermentforsch., 1936, 15, 177—182).—Parenteral injection of thyrotropic hormone leads to the formation of protective enzymes acting at first on substrates prepared from the thyroid, and later on those from other hormone-secreting organs, especially the pancreas. With thyroxine, pituitary substrate is the first attacked, then the thyroid, and, much later, those of other organs.

E. A. H. R.

**Adrenaline synthesis *in vitro* under physiological conditions. II. Production of tyramine from tyrosine in surviving tissue. Relation to adrenaline synthesis.** W. SCHULER, H. BERNHARDT, and W. REINDEL (Z. physiol. Chem., 1936, 243, 90—102; cf. A., 1935, 1014).—Surviving guinea-pig's kidney converts tyrosine (I) (but not NH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>Ph) into tyramine (II), the optimal conditions being:  $p_H$  8, (I) concn. 20—30 mg. per 100 c.c., concn. of kidney 0.9 g. per 15 c.c., time 3 hr., in air. The conversion is not due to bacteria. Liver does not produce (II) from (I) or from NH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>Ph.

W. McC.

**Method of obtaining active adrenaline and acetylcholine perfusates.** N. GAVRILESCU and N. IONESCU (Compt. rend. Soc. Biol., 1936, 123, 840—841).—The vagi of the frog are stimulated electrically during perfusion of Ringer's solution. Strong and weak stimuli cause secretion of acetylcholine and adrenaline, respectively.

H. G. R.

**Role of lactic acid in the "liberation" and the "binding" of adrenaline.** A. M. UTEVSKI (Ukrain. Biochem. J., 1936, 9, 833—849).—The medullary substance of the adrenal gland contains lactic acid (I). Adrenaline may exist in this body free (easily washed out), loosely combined (not capable of being washed out, but giving colour reactions), and in a more stable, combined form (capable neither of being washed out nor of giving colour reactions). (I) has a sp. effect in promoting fixation in the stable form. Succinic acid and AcOH do not have this property, and pyrotartaric acid shows the opposite effect.

F. A. A.

**Effect of adrenaline injection on blood of patients with and without spleens.** A. J. PATEK and G. A. DALAND (Amer. J. Med. Sci., 1935, 190, 14—21).—All cases showed leucocytosis and none showed change in concn. of red cells, hæmatocrit val., or hæmoglobin.

CH. ABS. (*p*)

**Effect on heart and blood-vessels of adrenaline, ephedrine, and related compounds.** A. STURM, K. GIETZ, and K. KEMPTÉ (Arch. exp. Path. Pharm., 1936, 183, 363—379).—Measurements of increase of blood-pressure show that in man, so far as the primary effect is concerned, ephedrine and sympathol chiefly affect the heart, adrenaline acts independently on heart and blood-vessels, and *m*-hydroxynorephedrine and adrenalone act almost exclusively on the blood-vessels.

W. McC.

**Action of adrenaline in the normal human eye.** S. C. HOWELL (Arch. Ophthalmol., 1934, 12, 833—841).

CH. ABS. (*p*)

**Influence of oxidation-reduction system on adrenaline action.** IV. K. TERAI and S. NOMURA (*Folia Pharmacol. Japon.*, 1935, 20, 56—73; cf. A., 1936, 116).—In warm- and cold-blooded animals adrenaline can be changed from the inactive into the active form by I and quinol or  $\text{NaHSO}_3$ .

CH. ABS. (p)

**Rôle of the corpora lutea in prolonging the life of adrenalectomised rats.** F. E. EMERY and E. L. SCHWABE (*Endocrinol.*, 1936, 20, 550—555).—The increase in survival period produced by pituitary implants or extracts is not due to the pituitary or sex glands or to theelin, but is probably concerned with secretion from active corpora lutea. R. N. C.

**Effect of environmental temperature and of salts on the survival period of adrenalectomised rats.** R. S. WEISER and E. R. NORRIS (*Endocrinol.*, 1936, 20, 556—560).—Rubin and Crick's salt solution increases the time of survival, particularly in older animals. There is an optimum environmental temp. of 30°. R. N. C.

**Effect of cortical hormone on mineral metabolism.** S. FIANDACA and S. SORCE (*Riv. Patol. sper.*, 1936, 16, 407—418).—The influence has been studied of injection of the principles A, B, and C of the adrenal cortex on the Ca, K, Mg, and P contents of the tissues, faeces, and urine of rabbits. A caused a reduction in the P vals. particularly in the liver, brain, and bones. The Ca content of the bones, muscles, and brain was reduced, but that of the kidneys, liver, and skin increased. K and Mg showed in general no significant changes. The excretion of Ca and P was increased in the faeces and particularly in the urine. B and C caused a similar lowering of P in the tissues, and an increased excretion. The other elements showed no marked changes. C produced less marked changes. NUTR. ABS. (m)

**Bitterling ovipositor lengthening produced by adrenal extracts.** B. O. BARNES, A. E. KANTER, and A. H. KLAUANS (*Science*, 1936, 84, 310).—Of the many tissues of dog examined, only adrenal extracts produced artificial lengthening. Similar extracts from other animals gave a positive reaction. Cryst. androsterone gave none. L. S. T.

**Preparation of extracts containing adrenal cortical hormone.** G. F. CARTLAND and M. H. KUIZENGA (*J. Biol. Chem.*, 1936, 116, 57—64).—The method consists essentially in extracting the hormone by means of  $\text{C}_6\text{H}_4\text{Cl}_2$  from a  $\text{COMe}_2$  and light petroleum extract of the glands. Extracts assaying 2500 dog units per kg. of fresh gland and 100 dog units per mg. of extracted solids are easily obtained. These extracts are practically free from adrenaline. J. N. A.

**Adrenal cortex. III. Isolation of two new physiologically inactive compounds.** O. WINTERSTEINER and J. J. PFEIFFER (*J. Biol. Chem.*, 1936, 116, 291—305).—Compound F,  $\text{C}_{21}\text{H}_{28}\text{O}_5$ , m.p. 203—209° (decomp.),  $[\alpha]_D^{25} +209^\circ$  in 95% EtOH [p-nitrobenzoate, m.p. 220—221°; disemicarbazone, m.p. >250° (decomp.)], a diketone (not pptd. by digitonin), was obtained by fractional crystallisation from EtOH of the "CHCl<sub>3</sub>-insol. fraction," preferably after an initial

purification with Girard's reagent. A compound G,  $\text{C}_{21}\text{H}_{24}\text{O}_3$ , m.p. 264° (decomp.),  $[\alpha]_D^{25} +38^\circ$  in 95% EtOH [semicarbazone, m.p. 263—265° (decomp.)], was also obtained. P. G. M.

**Adrenal cortex. II. Substance having the qualitative action of cortin; its conversion into a diketone related to androstenedione.**—See A., II, 25.

**Rôle of pituitary and adrenal glands in pancreatic diabetes of the toad.** B. A. HOUSSAY and A. BIASOTTI (*Compt. rend. Soc. Biol.*, 1936, 123, 497—500).—The diabetes is diminished by destruction of the adrenals or principal pituitary lobe, but reappears on injection of an extract of the latter. H. G. R.

**Action of pituitary extracts on blood-fats and -ketones in obesity.** G. BORRUSO (*Policlinico*, 1936, 43, 125—152).—In normal subjects the fasting val. for blood-ketones was 0.29—1.84 mg. per 100 ml.; ingestion of olive oil slightly increased the level, whilst injection of extract of the posterior lobe of the pituitary slightly decreased it; lipoitrin had the same effect. Injection of material from the anterior lobe increased the fasting level. In obese subjects the fasting val. for blood-fat was 67—122 mg. per 100 ml.; olive oil caused an increase of 18—123 mg., which is subnormal and was diminished by extract of the posterior lobe and lipoitrin; the fasting val. for blood-ketones was 0.58—2.72 mg. per 100 ml.; olive oil caused an average increase of 3.57 mg., which was more markedly diminished by extract of the posterior lobe than in normal subjects; lipoitrin also diminished the alimentary ketonæmia; material from the anterior lobe increased the blood-ketone level but less markedly and less regularly than in normal subjects. NUTR. ABS. (m)

**Action of pituitary hormone on blood-ketones in endogenous cachexia.** G. BORRUSO (*Policlinico*, 1936, 43, 153—163).—The effects were determined of ingestion of 100 ml. of olive oil and afterwards of 100 ml. of olive oil by mouth + 25 units of lipoitrin (I) intramuscularly on the blood-ketones of normal, obese, and pathologically thin people during a fast. In all subjects the oil alone caused an increase in ketones, most marked in the obese, at 1 and 4 hr. after ingestion, when blood sampling was stopped. (I) diminished the ketonæmia in the normal and obese but slightly increased it in the cachectic subjects. The ketone content of the blood varied within normal limits in the obese and cachectic. In another series of experiments (I) suppressed in 4 cachectic cases the lipæmia which normally follows ingestion of 100 ml. of olive oil. NUTR. ABS. (m)

**Specific dynamic action of proteins and pituitary functions.** J. MAHAUX (*Compt. rend. Soc. Biol.*, 1936, 123, 82—86).—A decrease in the sp. dynamic action after ingestion of glycine is suggested as a test of pituitary dysfunction in the absence of hepatic insufficiency. H. G. R.

**Blood-sugar in hypofunction of the rabbit pituitary; influence of glucose, adrenaline, and insulin.** G. SAITO (*Folia Endocrinol. Japon.*, 1934, 10, 35—47).—Administration of glucose or adrenaline

produces a greater increase in blood-sugar in normal than in hypophysectomised rabbits. The latter are extremely sensitive to insulin. CH. ABS. (p)

**Effect of complete and partial hypophysectomy in adult rats on nitrogen, calcium, and phosphorus metabolism.** D. PERLA and M. SANDBERG (Endocrinol., 1936, 20, 481—488).—Urinary N increases to > double the normal val. during the first 3 weeks after operation, and remains high for the next 9 weeks. The disturbance in N balance is less pronounced in animals deprived of the posterior and only part of the anterior lobe. Creatinuria occurs for 3 weeks after operation in males, but not in females. Ca excretion increases, particularly in the faeces, the balance remaining approx. zero even with a moderately high Ca intake. Ca metabolic disturbance lasts only 3 weeks in partly hypophysectomised animals. Faecal P increases progressively, but urinary P remains const. Cu and Fe metabolism show no significant changes. R. N. C.

**Composition of weight-loss and the nitrogen partition of tissues in rats after hypophysectomy.** M. LEE and G. B. AYRES (Endocrinol., 1936, 20, 489—495).—Loss of wt. over 1—33 days in hypophysectomised rats is 20% > that in controls restricted to the same low food intake. Controls lose no body-N, but the loss of body-fat is > that in hypophysectomised animals, which also lose N. Total energy metabolism is the same in both groups, but < that in normal controls fed unrestrictedly.  $\text{NH}_2$ -acid-, urea-, and total non-protein-N of the livers of hypophysectomised animals are > those in controls; similar smaller differences are found in other tissues, but other N constituents are not significantly affected. R. N. C.

**Effect of hypophysectomy and of phyone injections on the pancreas and liver of the newt.** A. E. ADAMS and E. N. WARD (Endocrinol., 1936, 20, 496—502).—Hypophysectomy decreases liver-glycogen (I) and increases liver-fat (II), whilst phyone decreases (I) and changes (II) only very slightly. R. N. C.

**Glycogen disappearance and carbohydrate oxidation in hypophysectomised rats.** R. E. FISHER, J. A. RUSSELL, and C. F. CORI (J. Biol. Chem., 1936, 115, 627—634).—With approx. equal amounts of muscle-glycogen (I) available at the start of a fasting period, the rats lost more (I) and had correspondingly higher vals. of R.Q. than did normal rats; the N excretions were approx. equal. The difference is diminished by intraperitoneal injection of alkaline extracts of anterior pituitary lobe which probably depress carbohydrate oxidation and thus effect maintenance of carbohydrate level. F. O. H.

**Diuresis in hypophysectomised toads after deprivation and injections of water.** R. Q. PASQUALINI (Compt. rend. Soc. Biol., 1936, 123, 71—73).—Diuresis depends chiefly on an increased renal permeability for  $\text{H}_2\text{O}$ , skin and tissues having a secondary effect. H. G. R.

**Diabetogenic function of the pituitary anterior lobe and the pancreas.** B. A. HOUSSAY and V. G. FOGLIA (Compt. rend. Soc. Biol., 1936, 123, 824—

827).—An extract of the anterior lobe diminishes the secretion of insulin, but the presence of the liver is necessary to maintain the hyperglycaemia since hepatectomy produces hypoglycaemia. H. G. R.

**Determination of the gonadotropic activity of pituitary anterior lobe extracts.** R. CAHEN and P. ARDOINT (Compt. rend. Soc. Biol., 1936, 123, 547—549).—The method depends on the increase in wt. of the uterus of the adolescent rat (cf., Bülbring and Burn, A., 1936, 527). H. G. R.

**Action of some posterior pituitary preparations on blood pressure and on smooth muscle organs.** K. TACHIBANA (Folia Pharmacol. Japon., 1935, 20, 191—200).—Pituitrin (I), pitressin (II), and pitocin (III) increased blood pressure, which was only partly diminished by yohimbine. The stimulatory effect of these preps. on various smooth muscles was not counteracted by atropine. (I) and (II) were more active than (III) except in the case of the uterus. CH. ABS. (p)

**Relation between external temperature and (i) the testes, (ii) the ovary, with respect to fat metabolism.** S. KANAUCHI (Folia Endocrinol. Japon., 1934, 10, 31—32, 33—34).—The influence of environmental temp. on the changes in fat content of various organs following the feeding of (i) powdered testes, (ii) interstitial tissue or corpus luteum powder, are recorded. CH. ABS. (p)

**Augmentation of ovary-stimulating action of gonadotropic preparations.** A. A. HELLBAUM (Proc. Soc. Exp. Biol. Med., 1936, 33, 568—570).—Material obtained from male human urine increases the effect on the ovaries of rats of pituitary extracts but not the effect of the follicle-stimulating and luteinising fractions of the extract when used alone. The material does not increase the action of human pregnancy urine and of blood-serum from pregnant mares. Extracts of milk, egg, liver, thyroid, and lemon increase the effects of pituitary extracts apparently in the same way as does the urinary material. W. McC.

**Relative gonadotropic augmentative action of plasma and formed elements from the blood of cattle.** L. E. CASIDA (Proc. Soc. Exp. Biol. Med., 1936, 33, 570—572).—The increase in the effect on the ovaries of rats of anterior pituitary extracts produced by the formed elements of cow's blood is > that produced by the blood-plasma. W. McC.

**Age and the ovarian response to gonadotropic hormone from the mare in the immature rat.** F. J. SAUNDERS and H. H. COLE (Proc. Soc. Exp. Biol. Med., 1936, 33, 504—505).—No ovulation or production of corpora lutea followed the injection of the hormone into female rats aged 18 days, but when the dose was large development of interstitial tissue was promoted. Follicular growth, ovulation, and production of corpora lutea followed the injection in rats 21 and 25 days old. W. McC.

**Means of augmenting the ovarian response to gonadotropic substances.** F. J. SAUNDERS and H. H. COLE (Proc. Soc. Exp. Biol. Med., 1936, 33, 505—508).—In immature female rats the ovarian development induced by injection of crude pituitary

extract is significantly increased by adding caseinogen (I) and ovalbumin (II) and increased threefold by adding  $\text{ZnSO}_4$  to the extract. The effect produced by  $\text{ZnSO}_4$  is not increased by addition of (I). The effect of injection of untreated serum from the pregnant mare is not increased by addition of  $\text{ZnSO}_4$ . Possibly (I), (II), and  $\text{ZnSO}_4$  act by delaying absorption of the active principle of the extract.

W. McC.

**Nature of antigonadotropic substances.** G. H. TWOMBLY (Endocrinol., 1936, 20, 311—317).—The gonadotropic hormone of human pregnancy urine injected into rabbits causes formation of protective substances (I) in the serum which prevent luteinisation in the ovaries of mice. The evidence suggests that (I) are protein antibodies.

R. N. C.

**Impairment of anterior pituitary functions by follicular hormone.** B. ZONDEK (Lancet, 1936, 231, 842—846).—Administration of the hormone to rats or birds over several months leads to the elimination of certain functions of the anterior lobe of the pituitary and ultimately produces eunuchoid rats or cocks. The follicular hormone does not inhibit production of the gonadotropic hormones in the anterior pituitary cells, but prevents their entry into the blood-stream.

L. S. T.

**Inhibitory effect of the follicular hormone on the anterior pituitary in humans.** M. S. JONES and T. N. MACGREGOR (Lancet, 1936, 231, 974—975).—Administration of dimenformone to women past the menopause resulted in an inhibition of the gonadotropic but not of the diabetogenic principle of the anterior pituitary.

L. S. T.

**Action of folliculin on vaginal  $p_H$ .** J. A. SCHOCKAERT and G. DELBUE (Compt. rend. Soc. Biol., 1936, 123, 306—308).—Administration of folliculin after the climacteric or ovariectomy increases the lowered vaginal  $p_H$  to normal vals.

H. G. R.

**Progesterin content of blood.** P. W. BLOCH (Endocrinol., 1936, 20, 307—310).—Traces of progesterin occur in the circulating blood of the sow and pregnant rabbit, but cannot be detected in 500 c.c. of blood of pregnant women.

R. N. C.

**Chemical fractionation of the prolans with formaldehyde.** A. BRINDEAU, H. HINGLAIS, and M. HINGLAIS (Compt. rend. Soc. Biol., 1936, 123, 393—394).—Prolan-B is gradually inactivated by contact with  $\text{CH}_2\text{O}$  whereas -A is scarcely affected.

H. G. R.

**Chemical studies on prolans (from urine of pregnancy).** F. BISCHOFF and M. L. LONG (J. Biol. Chem., 1936, 116, 285—290).—The standardisation is equally accurate whether wt. of ovaries, seminal vesicles, or prostate or the appearance of corpora lutea is taken as the criterion of activity. Prolan is inactivated (>90%) by acetylation, benzoylation, and reaction with  $\beta$ -naphthaquinonesulphonate or  $\text{H}_2\text{O}_2$ . Unlike the pituitary gonadotropic hormone, it is stable to  $\text{Me}_2\text{SO}_4$  in alkaline solution, and also to  $\text{HNO}_3$ ,  $\text{CH}_2\text{O}$ ,  $\text{CH}_2\text{I}-\text{CO}_2\text{H}$ ,  $\text{MeCHO}$ , and I at  $p_H$  3.5, whilst it is destroyed by I at  $p_H$  8.5.  $\text{CS}_2$ ,  $\text{PhNC}$ , and  $\text{PhN}_2\text{SO}_3\text{H}$  produce partial inactiv-

ation. 0.1N-HCl inactivates it rapidly at 40° and in 24 hr. at room temp.

P. G. M.

**Comparison of the Corner-Allen and Clauberg tests for assay of progesterin.** L. E. YOUNG (Proc. Soc. Exp. Biol. Med., 1936, 34, 96—99).—A Clauberg unit of progesterin is about  $\frac{1}{2}$  of a Corner-Allen unit. The former's method of assay is less accurate than the latter's unless a much larger no. of rabbits is used.

W. O. K.

**Migraine and ovarian deficiency.** S. J. GLASS (Endocrinol., 1936, 20, 333—338).—The normal prolans-A (I) and oestrin (II) ratio in young women is reversed in migraine with ovarian dysfunction. (II) gives relief by suppression of (I) secretion.

R. N. C.

**Oestrogenic hormone and mechanism of corpus luteum production in the rabbit.** C. BACHMAN (Proc. Soc. Exp. Biol. Med., 1936, 33, 551—554).—In the adult female rabbit during oestrus administration of oestrone does not cause luteinisation of the ovarian granulosa or increase the in wt. of the pituitary gland.

W. McC.

**Occurrence of oestrogenic substance in blood and tissues under pathological conditions.** VI. Comparison of amounts in blood and organs. F. SILBERSTEIN, P. ENGEL, and K. MOLNAR. VII. Destruction of menformone in blood and organs. F. SILBERSTEIN, K. MOLNAR, and P. ENGEL (Klin. Woch., 12, 1693—1694, 1694—1695; Chem. Zentr., 1936, i, 97—98).—VI. Organs (except testicles and adrenals) of irradiated dogs contained less oestrogenic substance than would be expected from the blood vals.

VII. Destruction of the hormone by blood is preceded by a change by which it is rendered insol. in  $\text{EtOH}-\text{CO}_2\text{Me}_2$ .

A. G. P.

**Effect of oestrogenic hormone on experimental pancreatic diabetes in the monkey.** W. O. NELSON and M. D. OVERHOLSER (Endocrinol., 1936, 20, 473—480).—Oestrone (I) reduces hyperglycaemia and glycosuria in monkeys given crude pituitary extract or when partly depancreatized. It increases the survival period of totally depancreatized animals and usually reduces hyperglycaemia and glycosuria. Oestriol *per os* is ineffective. Pituitary extract given during (I) treatment increases glycosuria. The effect of (I) is due to suppression of pituitary control of carbohydrate metabolism.

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**Effect of oestrogenic substance on blood-volume.** M. FRIEDLANDER, N. LASKEY, and S. SILBERT (Endocrinol., 1936, 20, 329—332).—Blood-volume is increased if initially < normal.

R. N. C.

**Oestrogenic substances in blood and urine after castration and the menopause.** R. T. FRANK, M. A. GOLDBERGER, and U. J. SALMON (Proc. Soc. Exp. Biol. Med., 1936, 33, 615—616).—In women the oestrogenic factor is excreted in the urine and excessive production of the gonadotropic factor occurs after ovariectomy, castration with X-rays, and the menopause.

W. McC.

**Determination of theelin with diazobenzene-sulphonic acid.** M. J. SCHMULOVITZ and H. B.

WYLLIE (J. Biol. Chem., 1936, **116**, 415—421).—Theelin ( $\leq 5$  rat units in 8.5 c.c.) is coupled with the acid to give a red dye which is compared colorimetrically with standard solutions of  $\beta\text{-C}_{10}\text{H}_7\text{OH}$  similarly treated. The method is suitable only for pure preps. P. G. M.

**Colorimetric determination of urinary oestrin.** G. PINCUS, G. WHEELER, G. YOUNG, and P. A. ZAHL (J. Biol. Chem., 1936, **116**, 253—266).—Different colorimetric procedures for the determination of oestrone (I), oestradiol (II), and oestriol (III) in human and rabbit urine extracts at various stages of the cycles are compared with biological determinations. The  $\text{OH}\cdot\text{C}_6\text{H}_4\cdot\text{SO}_3\text{H}$  test (Cohen and Marrian, A., 1934, 1269) gives trustworthy vals. for (III) in human urines from the 6th to 9th months of pregnancy, but during the earlier months, and in all rabbit urines, other substances interfere, leading to high apparent vals. For (I), this test gives high vals. at all stages. Results with other tests, using  $\text{BzCl}$  [colour with (I) and (II), not with (III)], and using  $\text{H}_3\text{AsO}_4$  [sp. for (III)] are given. F. A. A.

**Intravaginal assay of urinary oestrin.** W. R. LYONS and H. J. TEMPLETON (Proc. Soc. Exp. Biol. Med., 1936, **33**, 587—589).—Cornification is detected in ovariectomised rats following introduction into the vagina of material from 0.1—0.8 c.c. of normal woman's urine. W. McC.

**Antagonism between testicular extracts and certain hypnoanæsthetics.** R. FALK (Compt. rend. Soc. Biol., 1936, **123**, 779—781).—A sp. antagonism was observed between testicular extracts and certain barbiturates. H. G. R.

**Sparrow's bill as indicator for the male sex hormone.** I. Sensitivity. E. WITSCHI (Proc. Soc. Exp. Biol. Med., 1936, **33**, 484—486).—In normal male and female sparrows during the quiescent sex period and in castrated and ovariectomised sparrows the bill darkens when male sex hormone (I) is injected. Advantage may be taken of this fact in testing for (I) and a sparrow unit (equiv. to  $\geq 0.1$  rat unit and to approx. 0.5 Chicago capon unit) is adopted. W. McC.

**Enolacetates from progesterone and testosterone.**—See A., II, 25.

**Hypoglycæmic substances in various organs other than the pancreas.** I. Salivary glands, liver, and some parenchymatous organs. II. Mucosa of the digestive tract. III. Effect of these substances on the action of adrenaline and insulin on blood-sugar. IV. Physical and chemical properties of the substances: similarity to those of insulin and yeast extract. K. MAEHARA (Folia Endocrinol. Japon., 1934, **10**, 29—30, 30—31, 50, 50—51).—I, II. Aq. and EtOH-acid extracts of the organs contained active materials.

III. Acid-EtOH extracts of liver and of the mucous membrane of the small intestine retarded adrenaline hyperglycæmia and intensified insulin hypoglycæmia in rabbits.

IV. The action of the extracts was unaffected by heating at  $100^\circ$  for 30 min., was decreased by 0.05% of  $N\text{-HCl}$  or  $\text{-NaOH}$ , and was lost by adsorption on

animal C or by the action of trypsin. Insulin and yeast behaved similarly. CH. ABS. (*p*)

**Influence of insulin on heart-glycogen.** V. ZAGAMI (Atti R. Accad. Lincei, 1936, [vi], **23**, 524—528).—Insulin, injected into fasting rabbits, rats, or pigeons, increases the glycogen content of the heart and diminishes that of the skeletal muscle. F. O. H.

**Effect of insulin on alimentary hyperglycæmia and on the alcohol content of blood after consumption of alcohol.** K. R. KANITZ (Arch. exp. Path. Pharm., 1936, **183**, 380—386).—In rabbits given sugar and EtOH, the blood-EtOH is either unaffected or diminished by administration of insulin (I), the effect depending on the ratio in which the substances are given. The intoxication can be terminated or alleviated by (I) without concomitant reduction in blood-EtOH. W. McC.

**Effect on the isolated heart of the preservative present in insulin solutions.** B.P. M. M. O. BARRIE (Quart. J. Pharm., 1936, **9**, 485—492).—Injection of 1 c.c. (20 units) of insulin (20.6 units per mg.) in dil. HCl at 3.6 slightly increases the amplitude of beat of the isolated rabbit's heart, whilst the normal rabbit dose of 1.25 units has no effect. Similar solutions containing 0.3% of cresol (B.P. 1914) or 0.2—0.5% of PhOH + 0.2% of NaCl markedly decrease the amplitude. F. O. H.

**Degradation of insulin to a substance which increases the blood-sugar.** F. CHROMETZKA and J. SCHULTE (Arch. exp. Path. Pharm., 1936, **183**, 278—285).—Cryst. insulin (I) injected into a doubly ligated intestinal loop in living rabbits and cats increases the blood-sugar. Similar increases are produced by fluid taken from the loop after (I) injection and by the material produced from (I) by the *in-vitro* action of intestine, enterokinase, muscle, and kidney preps. Probably an enzymic degradation product of (I) is responsible for the effect. W. McC.

**Biological effects of pineal extract (Hanson).** L. G. ROWNTREE, J. H. CLARK, A. STEINBERG, and A. M. HANSON (Endocrinol., 1936, **20**, 348—359).

R. N. C.

**Action of acid and alkali on parathyroid hormone.** W. R. TWEEDY, C. H. SMULLEN, and W. P. BELL (J. Biol. Chem., 1936, **116**, 163—167).—The total N (14.74%) of parathyroid hormone is distributed as humin-N 0.95, dibasic N 21.13, acid amide-N 4.39, and non-basic N 71.53%. Acid hydrolysis (boiling 0.05*N*-HCl) results in an increase in  $\text{NH}_2\text{-N}$ , parallel with loss of hormonal activity. Activity is also lost by treatment with 0.05*M*-NaOH at  $38^\circ$ ;  $\text{NH}_3$  is produced in the reaction, corresponding with 0.27% of the total N. F. A. A.

**Glutathione and cathepsin of tissues during hyperthyroidism.** K. I. KATKOVA (Ukrain. Biochem. J., 1936, **9**, No. 1, 93—110).—In rabbits, thyroid feeding does not alter the cathepsin content of the liver or kidneys. W. O. K.

**Tissue-glutathione and -cathepsin after extirpation of the thyroid gland.** K. I. KATKOVA (Ukrain. Biochem. J., 1936, **9**, No. 1, 111—124).—In thyroidectomised rabbits glycerol extracts of the

iver showed no cathepsin activity whilst those of the kidneys were weaker than normal. No relation could be established between proteolytic activity and glutathione content. W. O. K.

**Metabolism of isolated fat-tissue. IV. Fat metabolism and hormones.** T. OESTREICHER (Arch. exp. Path. Pharm., 1936, 182, 589—616; cf. A., 1936, 629).—The normal metabolic rate ( $Q_{O_2}$ , —0.13) of isolated surviving testicular and subcutaneous fat (rat) in serum is unchanged by thyroidectomy but increased (to approx.  $\times 2$ ) by continuous administration of thyroxine (I); direct addition of (I) to, or pre-treatment with fresh thyroid gland of, fat- or liver-tissue *in vitro* does not increase  $O_2$  consumption (Paal, A., 1935, 410). Addition of thyrotropic anterior pituitary principle (II), but not that of other pituitary factors, increases  $O_2$  consumption of fat- but not liver-tissue whilst administration of (II) to rats causes a localised fusion of subcutaneous fat depôts and an increase in the *in-vitro*  $O_2$  consumption of the skin- but not testicular fat; the anaerobic glycolysis of both fats increases. Aq. extracts of anterior pituitary gland contain a "fat metabolism hormone" (Anselmino and Hoffmann, A., 1932, 780; Magistris, A., 1933, 1210) which acts like (II). F. O. H.

**Creatine studies in thyroid disorders.** G. W. THORN (Endocrinol., 1936, 20, 628—634).—Creatine (I) retention is reduced in patients with thyrotoxicosis; it is raised by administration of I. The change in (I) metabolism may persist for some time after partial thyroidectomy to relieve thyrotoxicosis. Creatinuria often precedes the metabolic rise following administration of thyroid to patients with myxœdema; (I) retention is decreased by thyroid administration. Cortical hormone does not reduce creatinuria in thyrotoxicosis. R. N. C.

**Effect of internal secretory organs on composition of skeletal muscle. I. Effect of thyroid gland.** S. OSADA (Folia Endocrinol. Japon., 1934, 10, 72—73).—Changes in the N distribution of rabbit muscle due to feeding thyroid powder and to thyroidectomy are recorded. CH. ABS. (p)

**Action of epithelial cellular and colloidal material of the thyroid gland. III. Effect on blood-sugar, adrenaline- and insulin-blood-sugar. IV. Influence on protein metabolism of normal white rats.** J. MATSUI (Folia Endocrinol. Japon., 1934, 10, 48, 49).—III. Administration of the cellular material to rabbits increased blood-sugar, retarded insulin action, and promoted adrenaline action. The colloidal material produced the reverse effects.

IV. In rats receiving cellular material there was an increase in total, urea-,  $NH_3$ -, creatinine- (I), and creatine- (II)-N of the urine. Feeding of colloidal material, decreased the total and urea-N, slightly increased the  $NH_3$ , and did not affect the (I) and (II) excreted. Cellular material increased and colloidal material lowered protein metabolism. CH. ABS. (p)

**Comparative calorogenic action of normal and pathological thyroid glands administered in equi-thyroxine doses.** W. W. PALMER and J. P.

LELAND (J. Clin. Invest., 1935, 14, 619—631).—The calorogenic activity of desiccated thyroid  $\propto$  the thyroxine (I) content. The activity of racemic (I) was approx. 50% of that of thyroid preps., due probably to the smaller action of *d*-(I).

CH. ABS. (p)

**Effect of alcohol- or acetone-extracts of thyroid gland on urinary excretion of iodine.** G. TANAKA (Folia Endocrinol. Japon., 1934, 10, 71—72).—After small injections of extracts, excretion of I was delayed, the period of excretion of I was prolonged and the total I excreted was decreased. Large doses increased the rate of I excretion and the total amount excreted.

CH. ABS. (p)

**Changes in endocrine glands, especially the thyroid, in white rats fed fungus growths or potassium iodide and tyrosine.** M. SHIMASAKI (Folia Endocrinol. Japon., 1934, 10, 64—65).—Addition of fungus to a basal diet caused hyperfunction of the thyroid and the thymus became hyperemic. Supplements of KI + tyrosine affected the thyroid similarly but no other glands were affected.

CH. ABS. (p)

**Use of thyroxine in ophthalmology.** P. C. JACKSON (Arch. Ophthalmol., 1934, 12, 635—643).—Thyroxine acts as a local metabolic stimulant. Its penetrative property is associated with its high org. I content.

CH. ABS. (p)

**Metabolic action of thyroxine in cold-blooded animals.** G. MANSFELD and A. LANCZOS (Arch. exp. Path. Pharm., 1936, 183, 267—273).—In spring, summer, and early autumn (but not in late autumn and winter) the urinary N excretion of *Rana esculenta* is greatly increased by administration of single and repeated doses of 0.2—0.5 mg. of thyroxine (I). The low urinary N excretion of frogs in autumn and winter is only partly due to lower temp. and is not affected by (I) or rise of temp. W. McC.

**Bioassay of galactin, the lactogenic hormone.** W. H. McSHAN and C. W. TURNER (Proc. Soc. Exp. Biol. Med., 1936, 34, 50—51).—Galactin may be conveniently assayed by its action on the proliferation of the crop-gland of the pigeon. W. O. K.

**Effect of lactogenic hormone on embryonic tissues cultivated *in vitro*.** A. J. SALLE and I. L. SHECHMEISTER (Proc. Soc. Exp. Biol. Med., 1936, 34, 603—606).—The hormone does not stimulate *in-vitro* growth of epithelial cells of the immature pigeon crop, nor has it any effect on non-sp. tissues.

**Mobility and gastric secretion during hypoglycæmia following ineretin administration.** J. LA BARRE (Compt. rend. Soc. Biol., 1936, 123, 275—276).—The increased mobility, hypersecretion, and hyperchlorhydria occur 2—3 hr. after the injection when the blood-sugar has fallen to 0.05—0.06%. H. G. R.

**Occurrence of melanophore hormone-like substances in urine.** P. E. SMOLA and L. RIVAS (Suomen Kem., 1936, 9, B, 24).—Urine of pregnant women and mares contains a substance which causes the expansion of the melanophore cells on frog skin. The urine from men and normal women gives a

positive reaction in only a few cases, whilst that from stallions, mares, and normal and pregnant rats gives no distinct reaction. The  $p_H$  of the immersion solution must be 7, and several dilutions of urine must be used. The active substance is adsorbable on C, and is probably not identical with the pituitary melanophore hormone.

J. N. A.

**Synergism and antagonism of vitamins.** W. STEFF (Ernahrung, 1936, 1, 26—31).—A review.

A. G. P.

**Identification of vitamins by molecular distillation.** K. HICKMAN (Nature, 1936, 138, 881—882).—Vitamins present in oils can be identified by mol. distillation. The amount of vitamin distilled with the oil over a range of temp. follows a typical "elimination" curve, deviations from which show the presence of different vitamins or vitamin compounds. Celanthrene Red 3B or dimethylaminoanthraquinone can serve as distillation pilots. Vitamin-A in cod- and halibut-liver oils exists almost entirely as esters, -D occurs in cod-liver oil partly free and partly as a mixture of esters. Calciferol and -D react producing other antirachitic substances.

L. S. T.

**Influence of carotene on experimental calcosis in avitaminosis-A.** A. ESCUDERO and P. BOSQ (Semana med., 1935, 42, 1632—1634; Chem. Zentr., 1936, i, 100).—Formation of calculi in kidneys of avitaminotic rats is decreased by administration of carotene.

A. G. P.

**Relation of the colour and carotene contents of butter fat to its vitamin-A potency.** R. TREICHLER, M. A. GRIMES, and G. S. FRAPS (Texas Agric. Exp. Sta. Bull., 1935, No. 513, 34 pp.).—Effects of various feeding stuffs on the carotene (I) content and -A potency of butter fat are recorded. The (I) content of milk from cows on pasture continued to increase after the -A potency had reached max. vals. The (I) content of the fat was directly related to that of the food. Butter fat of goats at pasture had low (I) and high -A contents. The ability of goats to transform (I) into -A is > that of cows. High colour in butter is generally but not always accompanied by high-A potency.

A. G. P.

**Hepato-hormonal regulation of vitamin-A metabolism and the aetiology of ostitis deformans.** Paget. E. SCHNEIDER and E. WIDMAN (Klin. Woch., 1935, 14, 1786—1790; Chem. Zentr., 1936, i, 1044).—The thyroid hormone regulates carotene and vitamin-A exchange. Ostitis results from a disturbance of this exchange.

A. G. P.

**Effects of vitamin-A on incidence and severity of colds among students.** H. C. CAMERON (J. Amer. Diet. Assoc., 1935, 11, 189—204).—Use of cod-liver, halibut-liver, and carotene oils reduced the duration and severity but not the no. of colds.

CH. ABS. (*p*)

**Effect of carotene and vitamin-A in diabetes mellitus. III. Effect of daily administration of carotene on blood-carotene in normal and diabetic individuals.** E. P. RALLI, A. C. PARIENTE, H. BRANDALEONE, and S. DAVIDSON (J. Amer. Med. Assoc., 1936, 106, 1975—1978).—Daily administration of 1 ml. of 0.3% solution of carotene (I) in oil

during 1—4 months to normal and diabetic patients caused a greater increase of blood-(I) with a slower return to the fasting level in the diabetics. When the blood-(I) level was raised by a preliminary large dose, further administration of 5 ml. daily caused a still greater increase above the normal and carotenæmia in the diabetic patients. In some of the normal and diabetic patients, the blood-cholesterol rose with the blood-(I).

NUTR. ABS. (*m*)

**Carotenæmia in diabetes.** W. HEYMANN (J. Amer. Med. Assoc., 1936, 106, 2050—2052).—Curves showing changes in the carotene (I) content of the blood-serum were obtained after administration of 2 ml. of 0.3% solution of (I) in oil to 10 diabetic children in 3 daily doses. The curves differed from those obtained from healthy children, the initial level being often high and the curve tending to remain high without the normal decline. Faulty utilisation of (I) is assumed.

NUTR. ABS. (*m*)

**Biological determination of vitamin-A and its pro-vitamin in the milk of Nordic women, in dog-rose fruits, and in black currants.** E. SVENSSON (Skand. Arch. Physiol., 1936, 73, 237—254).—The response (growth and healing of xerophthalmia) of rats depleted of vitamin-A when receiving 0.003 mg. daily of  $\beta$ -carotene, was about the same as with 0.05 g. of rose hip flesh, 1.0 g. of black currant fruit, 1.0 ml. of mixed colostrum or 2.0 ml. of mixed milk from Nordic women in Feb. and March. Rose hip contained 60—100, black currant 3—5, colostrum 3—10, and milk 2—5 international units of -A per g. and ml., respectively.

NUTR. ABS. (*m*)

**Determination of vitamin-A.** T. ROSENDAL (Nord. med. Tidskr., 1936, 11, 589—601).—Oil from fish and mammalian liver shows a biological activity in rat experiments which is attributed to vitamin-A and possibly an unknown substance, the separate existence of which has not been proved. In determinations of -A, the biological and spectroscopic methods with the unsaponifiable fraction give best agreement, but discrepancies occur which are considerably > the errors of the methods.

NUTR. ABS. (*m*)

**Skin lesions of the rat associated with the vitamin-B complex.** L. R. RICHARDSON and A. G. HOGAN (Missouri Agric. Exp. Sta. Res. Bull., 1936, No. 241, 36 pp.).—Irradiation of -B carriers in powder form destroys 50—60% of the antineuritic and 75—85% of the anti-dermatitis factor. Irradiation in <10% solution destroys <10% of the former and >90% of the latter factor.

A. G. P.

**Proteinogenous toxicosis. III. Rôle of the vitamin-B complex in processes of detoxication.** L. A. TSCHERKES and N. D. DUKLER (Ukrain. Biochem. J., 1936, 9, 925—941).—The toxicosis resulting from protein feeding can be restricted by addition of foods containing the vitamin-B complex. The amount necessary decreases with increasing age of the animal. The detoxicant is stable to heat and alkali.

F. A. A.

**Chemical determination of vitamin-B<sub>1</sub>.** V. A. DEVIATNIN (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4, 67—71).—1 c.c. of the test solution is added to a mixture of 6 c.c. of Kinnersley and Peters' reagent

[ $\text{Hg}(\text{OAc})_2\text{-PtCl}_4$ ], 2 c.c. of diazotised 0.5% aq. sulphanilic acid, and 3 drops of 40%  $\text{CH}_3\text{O}$ . The colour developed after heating for 10 min. at 90—95° is matched against standards. A. G. P.

**Flavin balance in the animal organism.** F. VIVANCO (Arkiv Kemi, Min., Geol., 1936, 12, A, No. 3, 1—8).—The organs of the rat richest in flavin (I) are the liver, kidneys, and heart. The adrenal gland is less rich, whilst spleen and muscle contain very little. During  $B_2$ -avitaminosis the (I) content of the above organs falls to 30% of its normal val. (I) continues to be excreted in the faeces but not in the urine. (I)-free urine is a criterion of  $B_2$ -avitaminosis. The wt. curve of the rat runs parallel with the amount of (I) excreted in the urine. E. A. H. R.

**Fixation of ascorbic acid by tissues.** H. C. HOU (Proc. Soc. Exp. Biol. Med., 1936, 34, 833—835).—Scurbutic tissues take up more ascorbic acid from Ringer's solution than does normal tissue. Various tissues take up the vitamin in the following descending order: adrenal, muscle, skin, intestine, kidney. P. G. M.

**Histochemistry. VIII. Relation between concentration of vitamin-C and development of pineal gland.** D. GLICK and G. R. BISKIND (Proc. Soc. Exp. Biol. Med., 1936, 34, 866—870).—The vitamin-C content of the pineal gland of the calf falls with increasing age, following a rise (to 0.27 mg. per g.) during the foetus stage. P. G. M.

**Vitamin-C and glutathione. Changes in blood-glutathione following parenteral administration of vitamin-C.** G. C. DOGLIOTTI, O. MELONI, and T. CASTELLANI (Boll. Soc. ital. Biol. sperim., 1936, 11, 667—669).—Parenteral administration of large doses of vitamin-C increases blood-glutathione in guinea-pigs (normally 0.030—0.037%) and men. F. O. H.

**Vitamin-C requirement during pregnancy and lactation.** W. NEUWEILER (Klin. Woch., 1935, 14, 1793—1794; Chem. Zentr., 1936, i, 1045).—In pregnancy the -C requirement is > and during lactation normal, as judged by the amounts excreted. A. G. P.

**Biological action of ascorbic acid. I. Neutralising effect on diphtheria toxin.** E. SCHWARZ and F. CISLAGHI (Minerva med., 1935, II, 202—205).—Ascorbic acid exerts an antitoxic effect at  $p_H$  3, but not at  $p_H$  7.0, when injected simultaneously with the toxin. When injected separately from the toxin no effect was shown. CH. ABS. (p)

**Vitamin-C deficiency in Addison's disease.** J. F. WILKINSON and C. A. ASHFORD (Lancet, 1936, 231, 967—970).—The degree of vitamin-C subnutrition paralleled the severity of the disease. The relationship of -C to pathological pigmentation is discussed. L. S. T.

**State of vitamin-C in animal tissues.** T. MASAYAMA and K. TATEMATSU [with K. NOGI and A. YONEDA] (Z. physiol. Chem., 1936, 244, 19—22).—The ascorbic acid (I) in the testes of the ox yields an orange osazone not identical with the red osazone obtained from cryst. (I). The red compound is

converted into the yellow by heating with dil. aq.  $\text{Na}_2\text{CO}_3$ . The autoxidation of cryst. (I), but not that of (I) in the testes, is prevented by addition of sliced liver. It is concluded that (I) in the ox testes is the free acid, not the lactone form. W. McC.

**Examination of cerebrospinal fluid in diagnosis of vitamin-C deficiency. Delayed excretion of ascorbic acid in cases with low ascorbic acid content in the fluid.** F. PLAUT and M. BULOW (Z. ges. Neurol. Psychiat., 1936, 154, 481—485).—Six institution patients showed varying levels of ascorbic acid (I) in the fluid. Administration of 600 mg. of (I) daily led to an earlier rise in urinary excretion in those with a high level in the fluid than in those with a low level. Vals. obtained with the fluid are possibly representative of the degree of saturation of the organism. NUTR. ABS. (m)

**Seasonal variations in vitamin-C content of cerebrospinal fluid.** G. K. STURUP (Hospitals-tidende, 1936, 79, 628—636).—The vals. for children were > those recorded by Plaut and Bulow and there was a marked decrease with age. The vals. in mentally abnormal but otherwise healthy patients in Nov. were definitely > those in Jan., Feb., and especially March. NUTR. ABS. (m)

**Physico-chemical processes in nervous tissue. III. Ascorbic acid content of the marmot brain during hibernation.** S. V. FOMIN (Ukrain. Biochem. J., 1936, 9, 879—895).—The ascorbic acid (I) content of the cerebellum and cerebral hemispheres of the marmot when hibernating is approx. 26% < that in the awakened state. No significant change occurs in the (I) content of the medulla oblongata. F. A. A.

**Effect of ingestion of acid and alkali on the amount of urinary vitamin-C.** E. E. HAWLEY, J. FRASER, L. BUTTON, and D. J. STEPHENS (Proc. Soc. Exp. Biol. Med., 1936, 34, 218—219).—In healthy persons consuming equal amounts of vitamin-C the -C content of the urine is diminished by alkalinity ( $p_H$  7.5—8.1) and increased by acidity in the urine. Possibly alkalinity such as is caused by ingestion of  $\text{NaHCO}_3$  facilitates increased storage of -C in the body. W. McC.

**Urinary excretion of ascorbic acid.** E. E. HAWLEY and D. J. STEPHENS (Proc. Soc. Exp. Biol. Med., 1936, 34, 854—858).—In unsaturated subjects little increase in the rate of excretion of vitamin-C occurred in the first few hr. after oral or intravenous administration. In saturated subjects 80—85% of the total 24 hr. excretion occurred during the first 12 hr. P. G. M.

**Isolation of vitamin-C from human placenta.** R. AMMON (Biochem. Z., 1936, 288, 93—101).—Placenta pulp (containing approx. 0.005% of ascorbic acid), following deproteinisation with  $\text{CCl}_3\text{CO}_2\text{H}$ , neutralisation by  $\text{NaHCO}_3$ , and acidification with  $\text{HCl}$ , was treated with 2:4-dinitrophenylhydrazine and the resulting ppt. fractionated (cf. this vol., 46) to yield the corresponding osazone of dehydroascorbic acid, m.p. 271—273°. F. O. H.

**Reducing power and vitamin-C content of transplantable tumours of the rat and guinea-**

pig. A. F. WATSON (Brit. J. Exp. Path., 1936, 17, 124—134).—The reducing power of 1 g. of dried Jensen rat sarcoma was equiv. to that of 1.1—1.5 mg. of ascorbic acid (I) and that of 1 g. of dried guinea-pig sarcoma to  $\geq 0.35$  mg. The latter val. was reduced in guinea-pigs on a scorbutic diet. Injections of 50 mg. of (I) daily restored the normal reducing power to the liver, adrenals, and tumours of scorbutic guinea-pigs, but 1 mg. daily failed to do so, although it promoted a steady wt. recovery and repair in the teeth and bones. A dose of 1 g. of dried Jensen rat sarcoma possessed for scorbutic guinea-pigs the curative effect of 1 mg. of (I). Guinea-pig tumours showed little -C activity even when fed in large amounts. Some evidence was obtained that tumour cells utilise -C. NUTR. ABS. (m)

Effect of fatigue and training on the ascorbic acid content of muscles. B. M. KOLDAEV and R. M. GELMAN (Ukrain. Biochem. J., 1936, 9, 655—663).—0.01—0.02 mg. of ascorbic acid (I) is present per g. of resting rabbit leg muscles. Fatigue, by electrical stimulation, usually decreases, and training, by repetition of the same stimulation, increases (11—44%), the (I) content. Local fatigue of the leg muscles does not affect the (I) content of the adrenals or liver. F. A. A.

Vitamin-C content of the adrenals of castrated rats. L. SAS (Biochem. Z., 1936, 287, 334—336).—The vitamin-C content of the liver of male rats was not but that of the adrenals in 8 of 11 rats was increased (by 34%) within 10 days of castration. P. W. C.

Reduced glutathione and vitamin-C in the granular venom of the toad (*Bufo vulgaris*). D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1936, 123, 654—656).—The venom contains 0.0266 of vitamin-C and 0.25—0.35% of reduced glutathione. H. G. R.

Distribution of vitamin-C in the organs of the toad (*Bufo vulgaris*). D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1936, 123, 798—800). H. G. R.

Antiscorbutic value of preserved foods. A. GIRO A. R. RATSIMAMANGA, M. A. MACHEBOEUF, H. CHEFTEL, and M. L. THUILLLOT (Bull. Soc. sci. Hyg. aliment., 1936, 24, 228—239).—By feeding a diet of preserved vegetables only to guinea-pigs deficient in ascorbic acid (I) the (I) content was partly restored. Hence preserved materials retain a significant amount of their (I) content. A method of determining the (I) content of the organs of a guinea-pig by the injection of acid  $\text{AgNO}_3$  into the blood stream is described. NUTR. ABS. (m)

Vitamin-C content of potatoes. I. Old stored potatoes of the 1935 crop. A. SCHEUNERT, J. RESCHKE, and E. KOHLEMANN (Biochem. Z., 1936, 288, 261—270).—The content of vitamin-C (determined by 2:6-dichlorophenol-indophenol; titration by I gives high vals.) varied considerably in different tubers even of the same sort; the highest vals. were approx. 0.030%. Boiling of the peeled potatoes in aq. NaCl considerably reduced the content, but the diminution was slight when the whole potatoes were steamed. F. O. H.

E (A., III.)

Influence of meat and of mate on human and experimental scurvy. C. GATTI, P. MENENDEZ, and A. KNALLINSKY (Arch. Farm. sperim., 1936, 62, 37—41).—Mate preps. did not prevent or modify an outbreak of human scurvy. Fresh meat had a protective action even after boiling for several hr. in open vessels, whilst dried meat and corned beef were inactive. These observations were confirmed by experiments on guinea-pigs. F. O. H.

Antiscorbutic activity of tomatoes submitted to various manufacturing processes. S. V. FOMIN and P. T. MAKAROVA (Ukrain. Biochem. J., 1936, 9, 387—394).—Whole tomatoes ("King Humbert") can be kept without loss of vitamin-C, but tomato paste is partly, and tomato purée completely, inactivated by the processes investigated, which involve heating in Cu vessels. F. A. A.

Preservation of vitamin-C in dried vegetables. V. I. DEMIN (Ukrain. Biochem. J., 1936, 9, 395—408).—Potatoes, onions, cabbages, carrots, and turnips, dried at 80—95° in an air stream for 3—4 hr., lose their vitamin-C activity, as tested chemically and biologically. F. A. A.

Determination of true vitamin-C content. P. E. SIMOLA, S. JALAS, and E. YLINEN (Suomen Kem., 1936, 9, B, 23—24).—Various chemical methods for determining -C are criticised. It is recommended to determine the reducing capacity towards dichlorophenol-indophenol before and after addition of an oxidase from a pumpkin extract. Normal urine contains 5—20 mg. of ascorbic acid per litre. The true -C contents of most plant tissues agree very well with the vals. obtained by the direct titration. J. N. A.

Chemical determination of ascorbic acid. II. Process of purification. Determination in urine. P. MANCEAU, A. A. POLICARD, and M. FERRAND (Bull. Soc. Chim. biol., 1936, 18, 1623—1635).—The treatment of biological fluids with  $\text{Hg}(\text{OAc})_2$  in the determination of ascorbic acid (I) in order to remove interfering reducing substances leads to the loss of only very small amounts of (I). Such treatment in neutralised  $\text{CCl}_3\text{-CO}_2\text{H}$  media leads to the complete removal of SH-compounds. The use of  $\text{Pb}(\text{OAc})_2$  instead of the Hg salt leads to considerable loss of (I) and does not completely remove SH substances. Such purification is essential especially prior to determination in urine, for which details of technique are given. P. W. C.

Vitamin-C content of blood. O. DEGGELLER, jun. (Diss., Univ. Utrecht, 1936, 88 pp.).—The ascorbic acid (I) content of human blood was 1.33—17.09 mg. per litre. A quantity  $>13$  mg. is thought to be "excellent" (saturation), 10—13 mg. "good," 5—10 mg. "sufficient,"  $<5$  mg. "insufficient." No difference in the (I) content of the blood was found between people with surgical diseases (e.g., hernia, fracture, commotio cerebri) and those suffering from internal diseases. There is an annual variation with a min. in Jan.—Mar. and a max. in June—Oct. Healthy people, living on a diet containing little or no (I) can be saturated with 1.5—3 g. People suffering from pulmonary tuberculosis need 2.5—4 g. With vals.

of 9—15 mg., urinary excretion of (I) occurs in people who have been saturated with (I) by one dose, the normal diet being deficient in (I). The capillary resistance determined by Göthlin's method cannot be used for the determination of a "pre-deficiency" condition. NUTR. ABS. (m)

**Determination of ascorbic acid in urine.** W. TSCHOPP (Z. physiol. Chem., 1936, 244, 59—77).—The urine should be as fresh as possible, but where necessary can be kept at 0° for >2 hr. with addition of 8—10% of AcOH. Interference by the colour of the urine is partly eliminated by 5- to 10-fold dilution with H<sub>2</sub>O. All the chemical methods so far suggested for the determination of ascorbic acid (I) in urine are non-sp., although some give accurate results with (I) in H<sub>2</sub>O. Normal urine probably contains no (I), but the increased reducing power observed after oral or parenteral administration of large amounts of (I) is due to (I), which is best determined by the procedure of Jezler and Niederberger (Klin. Woch., 1936, 15, 710). The methods of Wachholder *et al.* (A., 1935, 793), Emmerie and Eeckelen (A., 1934, 1043), and Fujita *et al.* (A., 1935, 793) are untrustworthy. W. McC.

**Detection of ascorbic acid in urine by means of 2:4-dinitrophenylhydrazine.** K. HINSBERG and R. AMMON (Biochem. Z., 1936, 288, 102—109).—Treatment of acidified (HCl) urine with the reagent yields a considerable ppt. of osazone which affords the osazone of ascorbic acid (which exhibits mutarotation in C<sub>5</sub>H<sub>5</sub>N—AcOH) on extracting with cold EtOH and Et<sub>2</sub>C<sub>2</sub>O<sub>4</sub>, in which it is insol. Ascorbic acid (even after its addition) could not be thus isolated from a normal sugar- and protein-free urine. F. O. H.

**Metaphosphoric acid in the extraction and titration of vitamin-C.** R. R. MUSULIN and C. G. KING (J. Biol. Chem., 1936, 116, 409—413).—A 2% concn. of HPO<sub>3</sub> protects a solution of ascorbic acid against air oxidation even in the presence of Cu or CCl<sub>3</sub>·CO<sub>2</sub>H, but does not interfere with the 2:6-dichlorophenol-indophenol reaction. P. G. M.

**Mode of action and metabolism of vitamin-D.** W. HEYMANN (J. Pediat., 1936, 8, 480—488).—Administration to rabbits of large single doses of viosterol (200,000 international units of vitamin-D) was followed in 5 days by a rise in blood-P, lasting 5—10 days but unaccompanied by any rise in blood-Ca. Daily intramuscular injection of 0.6 ml. of the serum of the treated rabbits cured rachitic rats in 8—10 days. Since the antirachitic substance in the serum was sol. in Et<sub>2</sub>O and oil, was destroyed by continued ultra-violet irradiation, and did not pass through the ultra-filter there was no evidence that any substance other than irradiated ergosterol was involved. -D remained in the blood-stream for 2—3 months. NUTR. ABS. (m)

**Comparative antirachitic value of crystalline vitamin-D administered in milk, corn oil, or propylene glycol.** J. M. LEWIS (J. Pediat., 1936, 8, 308—314).—Single doses of 145 or 290 U.S.P. units of cryst. vitamin-D, were administered to infants in the day's supply of milk, or dissolved in

maize oil or propylene glycol. The first method of administration afforded far greater protection against rickets than did the other two. Satisfactory protection against rickets in winter was afforded by 1450 U.S.P. units of cryst.-D daily dissolved in oil or by the addition of 333 units to a quart of milk. NUTR. ABS. (m)

**Line test assay for vitamin-D.** A. L. BACHARACH, E. ALLCHORNE, and H. E. GLYNN (Biochem. J., 1936, 30, 2004—2006; cf. Coward and Key, A., 1934, 931).—In rats receiving a more severely rachitogenic diet than that usually employed for the test the curative effect of vitamin-D supplements measured by the line test is significantly less when the single-dose method is adopted than when the dose is divided. Male rats respond somewhat better to the treatment than do female. W. McC.

**Effect of cholesterol feeding on growth of rats.** R. OKEY, H. L. GILLUM, and L. S. GODFREY (Proc. Soc. Exp. Biol. Med., 1936, 34, 131—133).—The growth of young rats on adequate and vitamin-deficient diets was not affected by addition of 1% of cholesterol (I). Retarded growth following addition of (I) to very similar diets (cf. Sperry *et al.*, J. Nutrition, 1935, 9, 131) was probably due to the absence from Sperry's diets of some factor (not vitamin-A, -D, -B<sub>1</sub>, or -B<sub>2</sub>) necessary for normal growth, coincident with storage of much esterified (I) in the liver. W. McC.

**Vitamin nature of flavones.** A. BENTSATH, S. RUSZNYAK, and A. SZENT-GYÖRGYI (Nature, 1936, 138, 798).—Curves show the effect of "citrin," the cryst. flavone fraction of lemon juice, in prolonging the life of scorbutic guinea-pigs. Vitamin-P (cf. A., 1936, 1162) appears to have a sp. effect on the capillary system. The results suggest that experimental scurvy is a deficiency disease caused by the combined lack of -C and -P. L. S. T.

**Transport in the cotton plant. VI. Interchange between tissues of the corolla.** E. PHILLIS and T. G. MASON (Ann. Bot., 1936, 50, 679—697; cf. A., 1936, 1162).—During the night preceding anthesis N, P, K, Mg, and Cl are imported into the corolla, and again exported on the succeeding night through the peduncle to the parent branch. Both movements probably take place through the phloem. Sap concns. are low during import and increase during the day of anthesis, because of the drying out of corolla tissue and the conversion of insol. into sol. materials. The distribution of sugar between tissues conforms to the distribution of solutes between liquids of different solvent capacity (cf. A., 1933, 988). The mechanism of the change of direction of solute movement is discussed. A. G. P.

**Physiological resistance [to salts] of cultivated grasses.** L. I. SERGEEV and A. M. LEBEDEV (Planta, 1936, 25, 84—103).—Winter rye showed the greatest and hard durum wheat the least resistance to salt solutions. Resistance of winter wheats generally was > that summer varieties. In concns. of 0.1—0.4M Na<sub>2</sub>SO<sub>4</sub> was less injurious to winter cereals than was NaCl. For summer varieties Na<sub>2</sub>SO<sub>4</sub> was the more harmful at all concns. The

general order of toxicity was  $\text{Na}_2\text{CO}_3 > \text{Na}_2\text{SO}_4 > \text{NaCl}$ . Resistant varieties absorb less salts than do sensitive varieties. Sensitivity is paralleled by permeability to salts, except in the case of hard wheat in which high sensitivity is attributed to lowered resistance of plasma colloids. Colloids of soft summer wheats are less hydrophilic than are those of winter strains. Resistance to frost and to salts is controlled by similar factors. A. G. P.

**Death of plant cells in single and balanced salt solutions.** V. S. ILJIN (Protoplasma, 1935, 24, 409—430).—Moderate concns. of NaCl and KCl were more toxic to plant tissues than more conc. or very dil. solutions. Addition of  $\text{CaCl}_2$  or of a balanced nutrient solution decreased the toxicity of NaCl and KCl.  $\text{CaCl}_2$  alone was in general more toxic than NaCl and KCl and its toxicity increased continuously with increasing concn. Resistance to  $\text{CaCl}_2$  increased with increasing Ca content of normal sap. The sap of poisoned tissues showed a ppt., probably of  $\text{CaC}_2\text{O}_4$ . M. A. B.

**Relation between exosmosis and salt absorption by potato tuber tissue previously treated with various salt solutions.** G. F. ASPREY (Protoplasma, 1935, 24, 497—504).—Treatment of potato tuber tissue with NaCl, KCl, and LiCl increases and with  $\text{CaCl}_2$  decreases both its subsequent absorption of  $\text{NH}_4^+$  and exosmosis of electrolytes into distilled water.  $\text{AlCl}_3$  decreases  $\text{NH}_4^+$  intake but increases exosmosis probably due to the acidity of its solutions. These effects are reduced by washing after salt treatment. They are probably due to alterations in the permeability of the tissue and do not indicate a quant. relationship between absorption and exosmosis. M. A. B.

(A) Drought-resistance in wheat. The "bound" and "free" water of expressed sap from wheat leaves in relation to time and soil moisture. (B) Diurnal variation in "bound" and "free" water and other factors in sap expressed from leaves of *Phalaris tuberosa*. J. CALVERT (Protoplasma, 1935, 24, 505—524, 525—530).—(A) Total and "free"  $\text{H}_2\text{O}$  in the sap vary directly with the soil moisture. A decrease in free  $\text{H}_2\text{O}$  is compensated by an increase in bound  $\text{H}_2\text{O}$ . As the free  $\text{H}_2\text{O}$  decreases the  $d$  of the sap increases. Straight regression lines of the % of bound  $\text{H}_2\text{O}$  had slopes agreeing with the reputed order of drought-resistance of the three wheats examined.

(B) The total and free  $\text{H}_2\text{O}$  (expressed per 100 g. of sap and per g. of dry matter) are higher in the morning than in the afternoon. Bound  $\text{H}_2\text{O}$  per 100 g. of sap is higher in the afternoon and per g. of dry matter in the morning. Results are discussed in relation to  $\text{H}_2\text{O}$  status and transpiration. M. A. B.

**Seasonal changes in the carbohydrates of the wheat plant.** H. R. BARNELL (New Phytol., 1936, 35, 229—266).—The % of sugars in the plant was sucrose (I) > glucose (II) > fructose (III). The proportions varied little during the winter, but in spring increased to reach maxima in a definite time sequence in the order, (II), (I), (III). After ear emergence sugar contents declined and that of starch

increased. Exposure of plants to low temp. caused an increase in sugar content, notably of (I). The mechanism of these changes is discussed. Two varieties examined showed similar general changes but a difference in the sensitivity of the (I) concn. to alteration during low-temp. treatment.

A. G. P.

**Effects of nutrient concentration on anatomy, metabolism, and bud abscission of sweet pea.** G. T. NIGHTINGALE and R. B. FARNHAM (Bot. Gaz., 1936, 97, 477—517).—Sand-cultured plants were grown with complete nutrients of the same composition but different concn. With low-concn. media plants produced vigorous and succulent growth, light green leaves, low % abscission of flower buds, high proportions of young active cells with dense protoplasm in roots and tops, and slow differentiation of tissue and maturation. High-concn. media had the reverse effects. Both series of plants had high  $\text{NO}_3^-$  contents. Those in dil. media had low carbohydrate (I) and high org. N (II) contents with much of the elaborated N as amides and  $\text{NH}_2$ -acids. Conc. nutrients produced high (I) and low (II) contents, the elaborated N being chiefly complex protein. The effect of conc. media resembled, in some respects, that of a low-N nutrient since the no. of active cells was relatively small and protein synthesis was limited. At the wilting point the soil solution becomes sufficiently conc. to cause early maturation of tissues.

A. G. P.

**Automatically-operated sand-culture equipment.** F. M. EATON (J. Agric. Res., 1936, 53, 433—444).—Apparatus for the maintenance of a const. flow of plant nutrients is described. A. G. P.

**Calcium requirement of lower algæ.** H. WARIS [WARÉN] (Planta, 1936, 25, 460—470).—Ca is essential for the growth of *Eremosphaera viridis* but not for *Microspora* spp. Mn is injurious to *E. viridis* in the presence of Ca. *Microspora* is injured by Mn only under conditions of Ca deficiency. A. G. P.

**Distant action of lead on plants.** W. STEMPELL, G. F. VON ROMBERG, and R. ULPTS (Protoplasma, 1935, 24, 622—626).—A Pb plate had no apparent influence on germinating seeds of *Sinapis alba* at a distance of 1—2 mm. M. A. B.

**Distribution of potassium in growing plants.** II. Response of certain cultivated plants to light intensity and potassium supply. A. FRANK (Bodenk. Pflanzenernähr., 1936, 1, 133—168).—The effects of varying levels of K and N supply on the growth and K and N "density" (i.e., wt., per unit area) of leaves together with the influence of shading are examined (cf. A., 1936, 257). A. G. P.

**Phosphorus relations of lemon cuttings grown in solution cultures.** A. R. C. HAAS (Bot. Gaz., 1936, 97, 794—807).—In culture media cuttings showed deficiency symptoms with 0—0.2 p.p.m. of  $\text{PO}_4^{'''}$ , irrespective of the frequency of change of nutrient solution. Slight deficiency was apparent with 1.0 but not with 2.0 p.p.m. of  $\text{PO}_4^{'''}$ . With conc. media (105 p.p.m.) cuttings grew well provided the nutrient was vigorously aerated. The % P in field-grown citrus leaves decreased with advancing

maturity. In mature original leaves of cuttings the P content increased with that of the medium. Max. % of reducing sugars in mature leaves occurred with 1–10.5 p.p.m. in the nutrient. The % of non-reducing sugars increased with the  $[\text{PO}_4^{'''}]$  of the medium. A relation is shown between the  $[\text{PO}_4^{'''}]$  of the nutrient and the dry matter and sucrose content of leaves. Acidity is greater in P-deficient than in healthy leaves. Absorbed  $\text{NO}_3^-$  remains largely unchanged in P-deficient plants (cf. B., 1936, 612, 1171). A. G. P.

Phosphorus nutrition of citrus.—See B., 1936, 1171.

Physiology of tannin in the plant cell. W. HAUSER (Protoplasma, 1935, 24, 219–224).—Pptn. of gelatin (I) by tannin (II) was prevented by treatment of (II) with NaOH to a faint alkalinity, thus giving conditions similar to those in the plasma. Under these conditions (II) retarded aggregation of (I) particles. By a similar action in the plant (II) probably regulates permeability, assimilation, etc. M. A. B.

Apparent nitrogen assimilation of germinating peas. P. W. WILSON (Biochem. Z., 1936, 287, 418–419).—The view that assimilation occurs still remains to be proved. P. W. C.

Nature of the excretion of nitrogen compounds from legume nodules. A. I. VIRTANEN (Nature, 1936, 138, 880–881).—Excretion occurs only in media (especially kaolin, sand, or soil) capable of absorbing the excreted  $\text{NH}_2$ -acids; in  $\text{H}_2\text{O}$  cultures it is negligible. It is helped by the presence of other plants. Excretion is marked in ordinary pot culture of legumes and non-legumes when other bacteria decompose aspartic acid and enable the non-legumes to utilise all the excreted N. Potatoes may deprive peas of N to such an extent that growth is seriously impaired. The extent of excretion varies with different strains of the nodule organisms, and a relatively low  $[\text{NO}_3^-]$  appears to lower excretion more than the N fixation. L. S. T.

Reduction of nitrates to nitrites by expressed juice of higher green plants. A. L. SOMMER (Plant Physiol., 1936, 11, 429–436).—In juices containing  $\text{NO}_3^-$  and glucose and in which the activity of micro-organisms was prevented by PhMe, no evidence of catalytic reduction of  $\text{NO}_3^-$  to  $\text{NO}_2^-$  in the absence of light was obtained. A. G. P.

Effects of nitrogen supply on rates of photosynthesis and respiration in plants. K. C. HAMNER (Bot. Gaz., 1936, 97, 744–764).—Increased supplies of  $\text{NO}_3^-$  to tomato plants having high carbohydrate (I) reserve caused increased transpiration. The extent of the response  $\propto$ , and the period preceding its appearance inversely  $\propto$ , the reserve (I) content. Generally similar results were obtained with wheat. A relatively high rate of photosynthesis may be maintained in leaves of high (I), low chlorophyll, and low sol. N contents. A. G. P.

Effect of carbohydrate and of nitrogen deficiency on microsporogenesis and the development of the male gametophyte in the tomato (*Lycopersicon esculentum*, Mill.). F. S. How-

LETT (Ann. Bot., 1936, 50, 767–803).—Carbohydrate deficiency suppressed the development of the male organs and induced degeneration of microspores and sterility in pollen. Deficiency of N had little influence on the development of the sexual organs. The bearing of these results on sex suppression and reversal in plants is discussed. A. G. P.

Anatomy of the testa of Leguminosæ. Hard-shelled seed and the significance of the strophilolum. K. ZIMMERMANN (Landw. Versuchs-Stat., 1936, 127, 1–56).—Hardness of seed is probably related to the thickness of the palisade layer and to its pectin content. A. G. P.

Influence of temperature treatment on carbohydrate metabolism, respiration, and morphological development of the tulip. II. L. ALGERA (Proc. K. Akad. Wetensch. Amsterdam, 1936, 39, 971–981; cf. A., 1936, 1568).—Cool storing prior to planting advances the period at which reducing sugars increase after planting. Cooling promotes starch (I) decomp., shifts the equilibrium, (I)  $\rightleftharpoons$  non-reducing sugars, towards higher sugar concn., and tends to increase the proportion of sucrose. Gaseous exchange in stored bulbs tends to be high at low temp. A. G. P.

Metabolic changes in unevenly illuminated seedlings. P. METZNER (Ber. deut. bot. Ges., 1936, 54, 455–471).—Exposure to light lowers the sugar concn. of the expressed sap, and decreases the acidity and catalase activity. These changes are discussed in relation to the phototropic response of plants. A. G. P.

Growth [of plants] in relation to ultra-violet radiation. B. N. SINGH, G. P. KAPOOR, and R. S. CHOUDRI (Bot. Gaz., 1936, 97, 649–665).—Effects of irradiation for varying periods at different intervals on germination, growth, and maturation are recorded. Results are ascribed to modification of net assimilation rate and the carbohydrate/N ratio. A. G. P.

Effect of narrow ranges of wave-lengths of radiant energy and other factors on the reproductive growth of long-day and short-day plants. N. A. SCHAPELLE (Cornell Univ. Agric. Exp. Sta. Mem., 1936, No. 185, 33 pp.).—Effects of irradiation, temp. and nutrient conditions are examined. A. G. P.

Effect of light on absorption of salts by *Elodea canadensis*. C. T. INGOLD (New Phytol., 1936, 35, 132–141).—Absorption of  $\text{K}^+$ ,  $\text{Cl}^-$ , and  $\text{PO}_4^{'''}$  is markedly increased by light. The final  $p_H$  of culture solutions in light was  $>$  than in darkness, probably due to preferential retention of cations in illuminated cultures. A. G. P.

Cell sap concentration in cereals. A. MUDRA (Z. Zuchtung [Pflanzenzucht.], 1936, A, 21, 59–67).—Seasonal variations in sap concn. are recorded. They are not paralleled by stomatal movements. Sun and shade have considerable influence on sap concn. Vals. are usually high in high-yielding varieties. A. G. P.

Influence of the various assimilating organs on the seed yield of wheat. A. E. H. R. BOONSTRA (Z. Zuchtung [Pflanzenzucht.], 1936, A, 21, 115–147).—

The effect of reduced C assimilation, caused by removal of various parts of plants, on grain yields is examined. The carbohydrate present in ripe grain is formed in approx. 5 weeks. A. G. P.

Measurement of respiration and carbon fixation of plants under controlled environmental conditions. J. W. MITCHELL (Bot. Gaz., 1935, 97, 376—387).—Appropriate apparatus and technique are described. A. G. P.

Effects of light and darkness on responses of plants to growth substances.—See B., 1936, 1171.

(A) Causes of pre- and post-floral movements of peduncles and scapes [of the genera *Papaver*, *Crepis*, and *Tussilago*]. (B) Development of the female gametophyte and the production of the growth-promoting hormone by flower buds. V. M. KATUNSKI (Compt. rend. Acad. Sci. U.R.S.S., 1936, 3, 343—346, 347—349).—(A) The drooping of the peduncle during development is related to over-production of growth-promoting substance (I) derived from the growing ovules. Subsequent normal erection and the premature straightening following decapitation are due to diminished supplies of (I) and to the resultant decrease in plasticity of the peduncle, which then shows the normal geotropic response.

(B) The production of (I) in flower-buds becomes max. during the stage of development of the female gametophyte at which cell division is most vigorous. A. G. P.

Hormonal theory of plant development. M. C. TSCHAJLACHJAN (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4, 79—83).—The blossom hormone ("florigen") passed from the leaves of a stock to the grafted scion of several species. It is not species-sp. A. G. P.

[Plant] cell elongation and the micellar theory. J. BONNER (Jahrb. wiss. Bot., 1935, 82, 376—412).—The mechanism of elongation of the cellulose framework of living cells is examined, and the action of growth-promoting substance on *Avena* coleoptiles is explained. A. G. P.

Effect of certain accessory growth-substances on the sporulation of *Melanospora destruens* and of some other fungi. L. E. HAWKER (Ann. Bot., 1936, 50, 699—717).—Addition of  $\alpha$ -inositol (I) to the (I)-free fraction of lentil extracts (Buston and Pramanik, A., 1931, 1458) was unnecessary for the sporulation of *M. destruens* but necessary for certain other fungi. Stimulatory effects are not attributable to carbohydrate or N food substances in the extract. Lentil extracts resembled active preps. obtained from fungi but contained more (I). A. G. P.

Vitamins and growth factors in plants. Action of vegetable extracts on development of *Phycomyces*. W. H. SCHOPFER (Arch. Mikrobiol., 1936, 7, 165—176).—Leaves of various plants placed in culture media exude substances which activate the growth of *Phycomyces*. The potency of the leaves is the same whether or not they contain chlorophyll. The growth factor is also extracted from leaves by EtOH and is adsorbed on animal C. The adsorbate contains 0.525% of N, is heat-stable in acid media, and resembles vitamin-B<sub>1</sub>. A. G. P.

Correlation effect of storage organs and growth-substance. R. DOSTAL (Ber. deut. bot. Ges., 1936, 54, 418—429).—The influence of stored materials in tubers on root and shoot development resembles and is in some respects complementary to the action of hetero-auxin. A. G. P.

Influence of growth-substance- and acid-pastes on the growth of *Avena* and *Helianthus* seedlings and its dependence on the oxygen content of the air. F. BRECHT (Jahrb. wiss. Bot., 1936, 82, 580—612).—The influence of the method of application of growth-substance (I) on its action in plants is examined. Non-purified conc. preps. from urine affect growth through the normal activity of (I) and also by means of an acid effect. Restricted proportions of atm. O<sub>2</sub> (2—5%) restrict and exclusion of O<sub>2</sub> prevents the growth of *Avena* coleoptiles. Low O<sub>2</sub> tension induces optimum extension in *Helianthus* hypocotls. The action of (I) and of acid on normal growth are causally unrelated. A. G. P.

Is the [plant] growth-substance species-specific? H. SODING (Jahrb. wiss. Bot., 1936, 82, 535—554).—Certain preps. of growth-substance (I) from various plant organs caused bending of *Cephalaria* but not of *Avena* coleoptiles. Differences are ascribed to relative sensitivity of the plants rather than to any fundamental difference in the action of (I). The *Avena* test is unsuitable for determining very small amounts of (I). (I) is not species-sp. A. G. P.

[Plant] growth-substance. H. DOLFEUS (Planta, 1936, 25, 1—21).—The distribution of growth-substance in several plant species is examined. Accumulation occurs in node and calyx of fruits. A. G. P.

Plant growth-substances. XXIII. Biotin and aneurin as phytohormones. Physiology of germination. F. KOGL and A. J. HAAGEN-SMIT [with B. TÖNNIS, W. VAN HASSELT, and L. PONS]. XXIV. Auto-inactivation of auxin-*a* and -*b*. F. KOGL, C. KONINGSBERGER, and H. ERXLEBEN (Z. physiol. Chem., 1936, 243, 209—226; 244, 266—278; cf. A., 1936, 1305, 1570).—XXIII. The biotin (I) contents of seeds of higher plants and the great differences sometimes observed between the contents of the various parts of the seeds are recorded. The growth of peas is greatly stimulated by very dil. solutions of (I), aneurin, and oestrone [e.g., 1 : 125 × 10<sup>6</sup> for (I)] but is not affected by ascorbic acid.

XXIV. Oxidation of  $\psi$ -auxin-*a* (II) in EtOH with KMnO<sub>4</sub> in 0.02N-Na<sub>2</sub>CO<sub>3</sub> and successive treatment of the lactone (III) of auxin-*a* (IV) in CHCl<sub>3</sub> with O<sub>3</sub> and KMnO<sub>4</sub> in 0.02N-Na<sub>2</sub>CO<sub>3</sub> give auxin-glutaric acid. (II) and (IV) exhibit no characteristic absorption of ultra-violet light. (II) in CHCl<sub>3</sub> with O<sub>3</sub> gives an ozonide which on decomp. with H<sub>2</sub>O and treatment with *p*-nitrophenylhydrazine gives the *p*-nitrophenyl-hydrazone, C<sub>19</sub>H<sub>29</sub>O<sub>3</sub>N<sub>3</sub>, m.p. 138.5°, of the intermediate product obtained by the action of O<sub>3</sub> on (III). Auxin-*b* (V), m.p. 183° (decomp.) (semicarbazone, m.p. 183°, [ $\alpha$ ]<sub>D</sub><sup>20</sup> -2.7° in EtOH), obtained from malt and from (III) by heating with KHSO<sub>4</sub>, exhibits an absorption bond at 250 m $\mu$  which persists in  $\psi$ -auxin-*b* (VI), the product of spontaneous inactivation

of (V). The light absorption curves of (V) and (VI) vary with the concn. of the solution similarly to those of  $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{Et}$ . The colour produced by addition of  $\text{FeCl}_3$  to (V), irradiated in  $\text{SiO}_2$ , indicates that (V) undergoes keto-enol transformation. The conversion of (IV) into (II) probably involves the shift of a double linking in an allyl group. Crystallographic data are given for (IV), (III), and (V). W. McC.

**Auxin and correlative inhibition.** B. LE FANU (New Phytol., 1936, 35, 205—220).—Growth of axillary buds on single-node stem cuttings and of young stems on whole shoots is inhibited by placing shoot bases in solutions of heteroauxin (I). Growth of young internodes is inhibited by lanoline preps. of (I) placed on stems below and accelerated by those placed above them. Buds of cuttings are inhibited by (I) in gelatin placed above or below them, the effect being smaller in the latter case. Inhibited shoots contain little or no auxin and have only a feeble ability to transport it. A. G. P.

**Theory of "yarovisation."** H. G. CHOLODNI (Compt. rend. Acad. Sci. U.R.S.S., 1936, 3, 391—394).—Mainly theoretical. "Yarovisation" is the shortening of the life cycle of the vegetable organism due to growth hormones adsorbed from the endosperm by a seedling lacking the possibility of normal growth. Roots of young maize seedlings in a moist atm. at 23—25°, when supplied with the growth hormone, blastanin, from pieces of endosperm, passed more quickly through all the stages of their development than control roots. J. N. A.

**Physiological characteristics of yarovised and non-yarovised winter wheat.** I. A. FILIPPENKO (Compt. rend. Acad. Sci. U.R.S.S., 1936, 3, 185—189).—Yarovisation influences the physico-chemical properties of plasma-proteins (increased  $\text{H}_2\text{O}$ -solubility, lowered thermostability) and increases the functional activity and chlorophyll content of the plant. A. G. P.

**Investigation of growth-promoting substances.** F. LAIBACH and R. LOTZ (Biochem. Z., 1936, 288, 250—256).—Methods and suitable apparatus for the extraction of growth-promoting substances (I) without heating and with exclusion of air, the removal of harmful constituents, the rapid detection of (I) in plant tissues, and the prep. of pastes of (I) in wool-fat and other media are described. F. O. H.

**Detection of cell-division growth-substance by means of *Saccharomyces cerevisiae* as test organism.** K. RIPPEL (Ber. deut. bot. Ges., 1936, 54, 487—492).—Appropriate technique is described. A. G. P.

**Accuracy of determinations of growth-substance.** I. JUEL (Planta, 1936, 25, 307—310).—Day-to-day variations in the bending of *Avena* coleoptiles following application of  $\beta$ -indolylacetic acid were 35%. A. G. P.

**Growth-substance inactivator from *Phaseolus* seedlings.** P. LARSEN (Planta, 1936, 25, 311—314).—The substance is obtained from the cut seedlings by means of agar or from the expressed sap. It is partly thermolabile and probably destroys the growth-substance. A. G. P.

**Heart rot of young sugar beet plants grown in culture solutions.** E. A. ROWE (Ann. Bot., 1936, 50, 735—746).—The necessary supply of B to sugar beet is maintained by 1 p.p.m. of  $\text{H}_3\text{BO}_3$  in culture solutions. Effects of B on the structural development of the plants are recorded. A. G. P.

**Biochemical detection of fluorine poisoning of plants.** A. CONTARDI and C. RAVAZZONI (Rend. Ist. Lombardo Sci. Lett., 1935, [ii], 68, 363—373; Chem. Zentr., 1936, i, 123).—The method is based on the observation that dissolved HF in leaves remains sol. for a long time and influences the enzyme action of the acid phosphatases of the shoot cuticle, whereas the normally occurring insol. fluorides show no such action. H. N. R.

**Barium content of Brazil-nuts.** K. WAGNER (J. pr. Chem., 1936, [ii], 147, 110—112).—Brazil-nuts, free from shell, contain 0.24—0.26%, and shells 0.046% Ba. This Ba is not extracted by  $\text{Et}_2\text{O}$ ,  $\text{EtOH}$ ,  $\text{H}_2\text{O}$ , or dil.  $\text{NH}_3$ , but is dissolved by 0.15% HCl. No Ba was found in hazel-nuts or pea-nuts. J. W. S.

**Distribution of manganese and iron in conifers in Quebec.** P. RIOU, G. DELORME, and HORMISDAS (Compt. rend., 1936, 203, 688—689).—Mn and Fe have been determined in the bark, sapwood, heartwood, branches, leaves, and fruits of the cedar, balsam fir, and hemlock-spruce. Cedar contains more Fe than Mn, which is entirely lacking from the heartwood. Spruce and fir contain more Mn than Fe. J. N. A.

**Phytochemical notes. I. *Monarda menthaefolia*.** R. S. JUSTICE (J. Amer. Pharm. Assoc., 1936, 25, 850—852).—Data are given for the content of  $\text{H}_2\text{O}$ , ash and its constituents, pentosan, crude fibre, tannin, and volatile oil of the flowers, leaves, stems, and roots and for the extractive action of various solvents on flowers, leaves, and stems. The 95%  $\text{EtOH}$  extract of flowers and leaves contains thymol, carvacrol, cymene, fatty acids, thymoquinol, and two yellow pigments, m.p. 216—218° and 204—205°, respectively. F. O. H.

**Mimosin.** J. RENZ (Z. physiol. Chem., 1936, 244, 153—158).—The sap from the tubular cells of young shoots and leaf stalks of *Mimosa pudica*, L., and *Leucaena glauca*, Benth., yields mimosin (I), an aromatic  $\text{OH}\cdot\text{NH}_2$ -acid (probably  $\text{C}_{16}\text{H}_{20}\text{O}_8\text{N}_4$ ), m.p. 227—228°,  $[\alpha]^{25}_D -21^\circ$  in  $\text{H}_2\text{O}$ , containing 2  $\text{NH}_2$  (one at  $\alpha$ ) and 3  $\text{CO}_2\text{H}$ . (I) in concns.  $\leq 0.0066\%$  gives a violet colour with  $\text{FeCl}_3$  and stimulates motion in the leaves of the plant at concns.  $\leq 0.03M$ . With  $\text{CH}_2\text{N}_2$  (I) yields an unstable substance, m.p. 104° (decomp.). W. McC.

**Origin of uric acid in plants.** D. MICHLIN and N. IVANOV (Planta, 1936, 25, 59—63).—The presence of uric acid in several legumes is confirmed. No evidence was obtained of the occurrence of a xanthine oxidase. A. G. P.

**Chemical composition of buds of *Populus balsamifera*.** A. GORIS and H. CANAL (Bull. Soc. chim., 1936, [v], 3, 1982—2009).—The buds are extracted with boiling 95%  $\text{EtOH}$  containing  $\text{CaCO}_3$ . The filtered extract, when cooled, deposits *l*-asparagine.

The extract is evaporated and sucrose and salicoside are isolated from the residue. The  $\text{Et}_2\text{O}$  extract of the residue or that obtained directly from the buds is shaken successively with aq.  $\text{NaHCO}_3$ ,  $\text{Na}_2\text{CO}_3$ , and  $\text{NaOH}$ , thus leading to the isolation of  $\text{EtCO}_2\text{H}$ ,  $\text{Pr}^n\text{CO}_2\text{H}$ , 4-hydroxy- and 2:3-dihydroxy-benzoic acid, 3:4-dihydroxycinnamic acid, a trihydroxy-methylanthraquinone, m.p.  $218^\circ$ , and an unidentified phenolic acid, m.p.  $224^\circ$ . The alkali-insol. portion gives cinnamyl and phenylethyl alcohol present as their cinnamic esters, a sesquiterpene alcohol,  $\text{C}_{15}\text{H}_{26}\text{O}$  [phenylurethane, m.p.  $150^\circ$  (corr.)],  $\text{COPhMe}$ , and 2:6-dihydroxy-4-methoxyphenyl  $\beta$ -phenylethyl ketone, m.p.  $168^\circ$  (block), which is stable towards alkali but is decomposed by boiling  $\text{HI}$  into  $\text{CH}_2\text{Ph}\cdot\text{CH}_2\cdot\text{CO}_2\text{H}$  and 1:3:5- $\text{C}_6\text{H}_3(\text{OH})_3$ ; it is obtained synthetically by passing  $\text{HCl}$  into a solution of  $\text{CH}_2\text{Ph}\cdot\text{CH}_2\cdot\text{CN}$ , 1:3:5- $\text{C}_6\text{H}_3(\text{OH})_3$ , and  $\text{ZnCl}_2$  in  $\text{Et}_2\text{O}$  and hydrolysis of the product to 2:4:6-trihydroxyphenyl  $\beta$ -phenylethyl ketone, m.p.  $141^\circ$  (corr.), which is methylated by  $\text{KOH}$  and  $\text{Me}_2\text{SO}_4$ . H. W.

**Biochemical study of Salicaceae; *Salix daphnoides*, Vill.** J. RABATÉ (J. Pharm. Chim., 1936, [viii], 24, 393—400; cf. A., 1936, 1571).—The  $\text{H}_2\text{O}$ -extract of the leaves of *S. daphnoides* affords salicoside (I) and daphneflavonol, m.p.  $285^\circ$  (decomp.) (block),  $[\alpha]_D^{25} -79^\circ$  in 85%  $\text{EtOH}$  (0.5 g. per 100 g. fresh leaves), hydrolysed by dil.  $\text{HCl}$  or 6%  $\text{H}_2\text{SO}_4$  to glucose and daphneflavonol, m.p.  $325^\circ$ , which, fused with  $\text{KOH}$ , gives protocatechuic acid and an unidentified phenol. From the  $\text{H}_2\text{O}$ -extract of the twigs, (I) (1%) and populoside are isolated. Both extracts also contain sucrose. J. W. B.

**Chief constituent of the ethereal oil of *Asa-fœtida*.**—See A., II, 3.

**Growth of plant cell-walls.** W. WERCIN (Angew. Chem., 1936, 49, 843—845).—X-Ray examination of growing hairs of cotton seed reveal the presence of an unidentified precursor (I) of cellulose (II) giving a diagram distinct from that of (II). No (II) is detectable until the 35th day of growth, after which a mixed diagram of (I) and (II) is observed until (I) finally disappears. Photomicrographs show that the time of first appearance of (II) coincides with the commencement of thickening of the cell wall, the external diameter of which does not sensibly increase. (II) is therefore to be regarded as consolidating and strengthening a structure already produced by (I). F. L. U.

**Analysis of carbohydrates of cell walls of plants. II. Determination of pentoses as single substances and in mixtures containing uronic acids and hexoses.** S. ANGELL, F. W. NORRIS, and C. E. RESCH (Biochem. J., 1936, 30, 2146—2154).—Modified procedure for determining furfuraldehyde (I) is described. The relation between phloroglucide and (I)-yielding substances singly and in admixture and in presence of glucose or galactose is determined. The results are treated mathematically. P. W. C.

**Hemicelluloses. V. Of maize cobs. VI. Of the hop (*Humulus lupulus*) flower.** S. ANGELL and F. W. NORRIS (Biochem. J., 1936, 30, 2155—2158, 2159—2165).—V. The optimum  $p_H$  for pptn.

of the hemicellulose from  $\text{NaOH}$  extracts of the cell wall material of fraction A (cf. A., 1930, 383) by  $\text{AcOH}$  is 4.0—4.1. Failure to ppt. at this  $p_H$  leads to a low yield of fraction A and to its appearance at later stages. Improved yields of these fractions are obtained by pptg. with glycerol and  $\text{CuSO}_4$  instead of Fehling's solution and by subsequent decomp. with  $\text{AcOH}$  instead of  $\text{HCl}$ .

VI. The optimum  $p_H$  for the most complete pptn. of fraction A hemicellulose (*loc. cit.*) is 3. Fractionation with glycerol- $\text{CuSO}_4$  shows that  $A_1$  and  $B_2$  are the largest fractions whilst  $C_2$  and  $B_1$  are very small. All fractions consist of anhydroxylose, anhydro-glucose, and glycuronic anhydride in different proportions. Hop hemicellulose belongs, therefore, to the xylan class usually found in lignified tissues.

P. W. C.

**Isolation and characterisation of a starch polysaccharide from the leaf tissue of the apple (*Malus malus*).** C. NIEMANN, A. B. ANDERSON, and K. P. LINK (J. Biol. Chem., 1936, 116, 447—455).—Leaves, autoclaved at  $115^\circ$  for 10 min. to inactivate enzymes, were rapidly dried at  $65^\circ$  and ground. The powdered material was extracted with boiling 85%  $\text{EtOH}$  containing 0.75%  $\text{HNO}_3$  and washed with cold  $\text{H}_2\text{O}$ . Boiling  $\text{H}_2\text{O}$  then extracted the polysaccharide (I) which was pptd. from a conc. solution by 4 vols. of  $\text{EtOH}$ , and dehydrated with  $\text{COMe}_2$ - $\text{EtOH}$ . After dissolution in  $\text{H}_2\text{O}$  and re-pptn. by  $\text{EtOH}$ , (I) was purified by prep. of the starch-iodide complex; yield, 1.6 g. from 960 g. of dried leaf. By acid and enzymic hydrolysis, (I) was shown to be a polyglucosan similar to  $\beta$ -amylose of cereal starches. P. G. M.

**Pectate and araban in the pecto-cellulosic membrane.** H. COLIN and S. LEMOYNE (Bull. Soc. Chim. biol., 1936, 18, 1578—1588).—Tables summarise the rotation, N, furfuraldehyde,  $\text{OMe}$ , and  $\text{CO}_2$  (separated by the action of  $\text{HCl}$ ) of fractions obtained by progressive depectinisation of desaccharified beet pulp by warm  $\text{H}_2\text{O}$  ( $95$ — $135^\circ$ ) and by diastatic action. Early aq. extracts contain preponderating amounts of pectate (I) and later extracts of araban (II). Diastatic action similarly liberates varying proportions of (I) and (II). Moreover material from which larger amounts of (I) have been removed by digestion with  $\text{H}_2\text{O}$  liberate larger amounts of (II) on subjection to diastatic action. The results do not support the view that the pectose is made up of (I) and (II) combined in definite proportions. P. W. C.

**Distribution of mannan in some gymnosperms.** A. NOWOTNOWNA (Biochem. J., 1936, 30, 2177—2183).—Conditions suitable for determination of mannose as phenylhydrazone are investigated. The determination of mannan (I) in woods and wood cellulose (II) is described. The major part of (I) in softwoods is associated with the (II) and considerable variation is found in the (I)/xylan (III) ratio of (II). (I) may be removed from (II) by dil. acid hydrolysis under the conditions used for extraction of (III). At the same time considerable loss of hexosan occurs. (I) and (III) are affected to different extents during treatment of (II) with alkalis. P. W. C.

**Association of xylan with cellulose in certain structural celluloses.** A. G. NORMAN (Biochem. J., 1936, 30, 2054—2072).—The cellulose (I) of plants and woods differs from that of cotton in containing cellulosans (II) which are tenaciously retained and must be regarded as an integral part of the (I) aggregate. Drying by heat produces changes in both components leading to increased availability to extracting and hydrolysing agents. This effect may be observed repeatedly in the same sample, the xylan (III) fraction being affected to a greater extent. The  $H_2O$ -sol. material obtained by heat-treatment contains fractions of higher (III) content. Uronic groupings are also present and some oxidation is probable. The (III) may be separated from (I) by treatment with acid or alkali but concurrent loss of hexosan also takes place. The material removed by dil. acid hydrolysis is not hydrolysed completely to reducing sugars. Continued boiling with alkali removes hexosan more quickly than (III). (I) from different plants behaves differently towards hydrolytic and extraction agents. The results support the view that the (II) fraction of the cellulosic aggregate of plants and woods is oriented and participates in the micellæ, being retained by secondary valency forces identical with those between parallel (I) chains in pure cotton (I). P. W. C.

**X-Ray diffraction patterns of crystalline tobacco mosaic proteins.** R. W. G. WYCKOFF and R. B. COREY (J. Biol. Chem., 1936, 116, 51—55).—The patterns obtained from cryst. tobacco mosaic virus proteins, with many sharp reflexions between 8  $m\mu$  and 0.3  $m\mu$ , are the same as those from true crystals composed of large mols. Repeated recrystallisation did not alter the pattern, and no difference was found between the proteins of the ordinary and the aucuba strains of the disease. J. N. A.

**Constituents of *Epimedium macranthum*, Morr and Decne. II. Constitution of a new flavone glucoside. Relationship between icaritin, anhydroicaritin, and  $\beta$ -anhydroicaritin and oxidation of anhydroicaritin. III. Synthesis of anhydroicaritol and anhydroicaritin trimethyl ether.**—See A., II, 7.

**Glucosides of the flavone series. III. Constituents of *Trifolium repens*, L.**—See A., II, 7.

**Constituents of the common poppy (*Papaver rhoeas*).** W. AWE (Arch. Pharm., 1936, 274, 439—445).—The colour reactions of rheadine are different from those of chelidonine, cryptopine, and hydrastine. It contains 1 OMe; rheagenine contains none (cf. Spath *et al.*, A., 1936, 1003).

F. R. G.

**Constituents of *Drosera rotundifolia*.**—See A., II, 25.

**Fruits of *Solanum xanthocarpum*.**—See A., II, 39.

**Resin alcohols of mistletoe.**—See A., II, 28.

***Cuscuta reflexa*, Roxb. IV. Isolation of a new yellow flavone colouring matter from the seeds.**—See A., II, 29.

**Polyterpenoids and their glucosides. VI. Saponin from the bark of *Schima kankaoensis*.**—See A., II, 27.

**Alkaloid of *Stephania cepharantha*, Hayata.**—See A., II, 39.

**Constituents of *Daphne genkwa*, Sieb. and Jucc. III. Synthesis of genkwainin.**—See A., II, 29.

**Determination of pressure of carbon dioxide in small amounts of liquids containing carbonic acid.**—See A., I, 50.

**Hydrogen electrode.**—See A., I, 49.

**Use of silver nitrate for the study of the texture of bones.** M. PRENANT (Compt. rend. Soc. Biol., 1936, 123, 472—473).—After treatment with dil. gelose, a dil. solution of  $AgNO_3$  is used, when the fibres can be traced by the  $Ag_3PO_4$  crystals.

H. G. R.

**Synthetic organic dyes as contrast media in roentgenography. III. Experimental studies on bladders of rabbits.** S. ISAHAYA (Acta Dermatol., 1934, 24, 82—96).—20 c.c. of 5% aq. dye solution were injected into the bladders of rabbits. The dyes which cast a clear roentgenogram shadow without forming any ppt. were; rose-Bengal, methyleosin, eosin 3G, erythrosin, rose-Bengal BT, phloxine B, and eosin C.P. bluish. CH. ABS. (e)

**Determination of degree of fineness of X-ray "contrast substances" [barium sulphate].**—See A., I, 44.

**Determination of small amounts of benzene in biology.** ANON. (Rev. pétrolifère, 1935, 1307—1308; Chem. Zentr., 1936, i, 1668).—The  $C_6H_6$  is nitrated and weighed as  $C_6H_4(NO_2)_2$ . H. N. R.

**Permanent standards for the turbidimetric determination of protein.** E. J. KING and G. A. D. HASLEWOOD (Lancet, 1936, 231, 1153).—The prep. of suitable standards is described. L. S. T.

**Conductometric method for micro-determination of urea.** V. RANGANATHAN and B. N. SASTRI (Biochem. J., 1936, 30, 2135—2139).—The method is based on the change of conductivity resulting from the hydrolysis of urea by urease and gives good results with urine, blood, and milk. P. W. C.

**Determination of iodine.** B. F. STIMMEL and D. R. McCULLAGH (J. Biol. Chem., 1936, 116, 21—24).—The method (A., 1934, 1379) for determining I in blood and tissue is modified. J. N. A.

**Micro-volumetric sodium method of Ball and Sadusk.** B. HOLMES and P. L. KIRK (J. Biol. Chem., 1936, 116, 377—380).—A modification of the method (A., 1936, 747) is described. P. G. M.

**Determination of lead in organs, bones, and sera.** A. J. HILMAN (Meded. Dienst. Volksgesondh. Nederl-Indie, 1935, 24, 139—141; Chem. Zentr., 1936, i, 1658).—The dithizone method is adapted. In Pb poisoning of children the Pb content of bones and pituitary is high. Small increases in spinal fluid and brain are recorded. Pb is pptd. in liver and kidneys. A. G. P.

# BRITISH CHEMICAL ABSTRACTS

## A., III —Biochemistry

FEBRUARY, 1937.

**Nervous control of gaseous exchange.** M. POLITZER (Arch. Farm. sperim., 1936, **62**, 108—116).—The ventilation equiv. of  $O_4$  (*i.e.*, amount of air of respiration or ventilation necessary for the utilisation of 100 c.c. of  $O_2$ ) is diminished in man by administration of ergotamine. The pulmonary  $O_2$  consumption is regulated not only by the vagus but also by the sympathetic nervous system.

F. O. H.

**Effect of hæmolytic substances on white cell respiration.** E. PONDER and J. MACLEOD (J. Gen. Physiol., 1936, **20**, 267—281).—The  $O_2$  consumption of white cells from rabbit peritoneal exudates is markedly reduced, owing to cytotoxicity, by saponin, bile salts, or Na oleate. Much larger ( $\times 35$ ) amounts of the lysin are required to reduce the respiration of white cells than to hæmolyse red cells. The lysin combines with the white cells. Freezing and thawing, or immersion in hypotonic NaCl solutions, also reduces the respiration of white cells.

F. A. A.

**Adsorption at surfaces of red cells.** B. R. MONAGHAN and H. L. WHITE (J. Physical Chem., 1936, **40**, 1063—1070; cf. A., 1936, 1399).—Contrary to the statement of Bellis and Scott (A., 1935, 1393) normal red cells do not adsorb measurable quantities of gelatin or plasma-proteins. Addition of lecithin inhibits the sedimentation of dog cells in plasma or gelatin owing to absorption by the lecithin decreasing the effective protein concn.

F. L. U.

**Sedimentation of erythrocytes in globulin solutions.** S. P. LUCIA, S. M. GOSPE, and J. W. BROWN (Proc. Soc. Exp. Biol. Med., 1935, **33**, 356—358).—No relationship was traced between the rate of sedimentation of erythrocytes in solutions of human and ox serum-globulin (I) and the (I) content of the solutions.

W. McC.

**Formation of methæmoglobin by aniline.** W. HEUBNER and G. SCHWEDTKE (Arch. exp. Path. Pharm., 1936, **184**, 80—82).—Since on subcutaneous injection into cats of aq.  $NH_2Ph$  the mol. ratio of injected  $NH_2Ph$  to methæmoglobin formed is  $<1$ , the view that  $NHPh\cdot OH$  is formed as an intermediate is discountenanced in favour of the view that the *p*-aminophenol-iminoquinone system is formed and acts catalytically.

P. W. C.

**Photo-electric method for recording fast chemical reactions and its application to the study of catalyst-substrate compounds.**—See A., I, 100.

**Separation of serum-albumin into two fractions.** I. L. F. HEWITT (Biochem. J., 1936, **30**,

2229—2236; cf. A., 1935, 256).—The fractions were obtained from the plasma of horse's blood by fractional pptn. with  $(NH_4)_2SO_4$ . The properties of the least sol. cryst. and the most sol. fractions were respectively: carbohydrate content 0.5 and 8.5%, N content 14.4 and 13%,  $NH_2$ -N content 1.0 and 0.65%,  $[\alpha]$   $-70.8^\circ$  and  $-57.1^\circ$ , coagulation temp.  $60^\circ$  and  $80^\circ$ , tryptophan content 0.26 and 1%, tyrosine content 4.79 and 5.38%. The fraction most sol. in aq.  $(NH_4)_2SO_4$  yields much humin on hydrolysis with HCl whilst the cryst. fraction remains colourless.

W. McC.

**Protein equilibrium of serum in histamine shock.** N. FIESSINGER, A. GAJDOS, and E. PANAYOTOPOULOS (Compt. rend. Soc. Biol., 1936, **123**, 967—969).—Intense histamine shock in dogs without anæsthesia increases serum-globulin and decreases -albumin.

H. G. R.

**Protein content of the blood-plasma of insects.** M. FLORKIN (Compt. rend. Soc. Biol., 1936, **123**, 1024—1026).—The vals. for the species studied were Orthoptera (*Dixippus morosus*) 1.03, Lepidoptera (*Bombyx mori*) 1.96, Coleoptera (*Hydrophilus piceus*) 3—4, and Hymenoptera (*Bombus agrorum*) 5%.

H. G. R.

**Dependence on urea of "residual nitrogen-difference" in blood and urine.** H. THELEN (Biochem. Z., 1936, **288**, 338—347).—The residual N difference (I) [*i.e.*, the difference between  $CCl_3\cdot CO_2H$  and phosphotungstic acid (II) pptns. of residual N] of blood depends on urea concn., high vals. of which cause increased pptn. of N by (II). (I) in urine is independent of urea concn. but is increased by dilution *in vitro* and diminished by dilution *in vivo* ( $H_2O$  diuresis).

F. O. H.

**Variation in blood-sugar with blood-nitrogen.** J. LOISELEUR (Compt. rend. Soc. Biol., 1936, **123**, 946—949).—Hyperglycæmia occurs when blood-urea is increased.

H. G. R.

**Effect of blood from depancreatized dogs on blood-sugar of normal dogs.** F. RATHERY, BARGETON, and DE TRAVERSE (Compt. rend. Soc. Biol., 1936, **123**, 1036—1038).—Hyperglycæmia is observed in most cases, but sometimes this is replaced by hypoglycæmia.

H. G. R.

**Reducing and fermentable substances in the body-fluids of *Arenicola*, *Dasybranchus*, and *Stipunculus*.** M. FLORKIN (Compt. rend. Soc. Biol., 1936, **123**, 1022—1024).—The cœlomic plasma contains 0, 8—9, and 2.2—8.7 mg. of reducing substance (as glucose) per 100 c.c., respectively, whilst the

blood-plasma of *Arenicola* contains 12 mg. per 100 c.c. H. G. R.

**Cerimetric determination of glucose in 0.01 c.c. of blood.** R. VANOSI and R. FERRAMOLA (Biochem. Z., 1936, 288, 369—374).—The authors' method (A., 1936, 968) for 0.1 c.c. is modified for 0.01 c.c. of blood. Deproteinisation is effected by  $\text{Al}(\text{OH})_3$ .

F. O. H.

**Determination of blood-carotene.** E. DANIEL and G. J. SCHEFF (Proc. Soc. Exp. Biol. Med., 1936, 33, 26—30).—Details of the method are given. It is unsuitable for blood containing lycopene. Xanthophylls are removed by treating an  $\text{Et}_2\text{O}$ -light petroleum solution with MeOH. P. G. M.

**Direct determination of oxalic acid in blood.** S. SUZUKI (Z. physiol. Chem., 1936, 244, 235—237; cf. A., 1934, 1122).—A reply to the criticisms of the author's method (Thomsen, A., 1936, 223).

W. McC.

**Silicic acid content of blood of puppies inhaling quartz dust.** M. SCHONFELDER (Arch. Hyg. Bakt., 1936, 117, 44—52).—The  $\text{SiO}_2$  content of the blood of puppies inhaling quartz dust for periods of 1 to 12 months was increased by 130% (from 1.4 to 3.3% of the sulphated ash). Intravenous injection of tubercle bacilli raised the  $\text{SiO}_2$  content by 17%.

W. L. D.

**Diffusible and non-diffusible calcium of blood following overdosage with parathyroid hormone or irradiated ergosterol.** J. F. SYKES (Trans. Roy. Soc. Canada, 1936, [iii], 30, V, 27—30).—In dogs there is an increase in the ratio of non-diffusible to diffusible Ca.

J. N. A.

**Permeability of tissue cells to potassium.** J. I. THALER (Proc. Soc. Exp. Biol. Med., 1935, 33, 368—371).—In cats the [K] in plasma and in whole blood increase as the circulatory vol. decreases (bleeding). The concn. returns to normal if the vol. is subsequently increased by re-injection of the blood or by injection of saline solution. Injection of adrenaline causes transitory and that of histamine more prolonged increases in plasma-K. W. McC.

**Distribution of iron and zinc in blood plasma, the protoplasm of blood corpuscles and their nuclei, in different animals.** N. YAKUSIZI (Keijo J. Med., 1936, 7, 276—288).—The Fe content of blood from the stork, Japanese crane, toads, and bony and cartilaginous fish increases with a rise in the animal scale. The total Fe of corpuscle nuclei is that in the surrounding protoplasm or whole blood. Blood-Zn increases with a descent in the animal scale, and the Zn content in the nuclei is > that in nuclear protoplasm or whole blood.

F. A. A.

**Distribution of iron and zinc in plasma, protoplasm, and nucleus of different kinds of pus, and the biological significance of these metals.** N. YAKUSIZI (Keijo J. Med., 1936, 7, 289—300).—In the plasma (I), corpuscle protoplasm (II), and corpuscle nuclei (III) of pus from both acute and chronic discharging conditions, the Fe content is in the order (II) > (III) > (I). The Zn, in acute pus, gives (III) > (II) > (I), in chronic pus (II) > (I) >

(III). The amounts of Fe and Zn range from about 1 to 10 mg. per 100 g. of dry substance. F. A. A.

**Effect of intravenous injections of suspensions of solids on blood-chloride.** A. LUMIERE, P. MEYER, and H. VERGNE (Compt. rend. Soc. Biol., 1936, 123, 906—908).—In addition to hyperglycæmia and hypoproteinæmia, injection of suspensions of inert solids causes a hyperchloræmia the intensity of which depends on the physical nature of the particles.

H. G. R.

**Physical chemistry of fish blood.** A. DRILHON and G. FLORENCE (Arch. Phys. biol. Chim.-Phys. Corps, 1935, 12, 180—198; Chem. Zentr., 1936, i, 1249).—Buffer curves of the serum together with cataphoretic measurements show the similarity of sera of sea- and fresh- $\text{H}_2\text{O}$  fishes and the differentiation of those of Elasmobranchii.

A. G. P.

**Histochemical demonstration of removal and fixation by dielectrolysis of ions previously introduced into the blood.** G. BOURGUIGNON and M. MONNIER (Compt. rend. Soc. Biol., 1936, 123, 975—978).

H. G. R.

**Water and electrolyte distribution in plasma, red blood cells, and muscle after adrenalectomy.** A. H. HEGNAUER and E. J. ROBINSON (J. Biol. Chem., 1936, 116, 769—778).—In adrenalectomised cats, the plasma-osmotic pressure remains unchanged, but the Na and K levels are greatly reduced, rendering the plasma hypotonic to the red cells. Simultaneously with an uptake of  $\text{H}_2\text{O}$  by the red cells there is an outward migration of Na. The K content of both plasma and red cells increases but the latter increase does not compensate for the Na decrease. An intracellular increase of total  $\text{H}_2\text{O}$  may occur in muscle. The K content also increases so that the high plasma-K is not due to liberation of K from muscle.

E. A. H. R.

**Water and electrolyte distribution between plasma and red blood cells after intraperitoneal injections of isotonic glucose.** E. J. ROBINSON and A. H. HEGNAUER (J. Biol. Chem., 1936, 116, 779—786).—The plasma of cats and rabbits after injection of glucose shows changes in electrolyte content similar to those in adrenal insufficiency (cf. preceding abstract). When the electrolyte balance of plasma is sufficiently altered, the red blood cell membrane probably becomes more permeable to cations.

E. A. H. R.

**Does the blood-cerebrospinal fluid equilibrium obey Donnan's or Derrien's law?** Y. DERRIEN (Compt. rend. Soc. Biol., 1936, 123, 911—913).—Experimental results agree with those predicted from Derrien's law.

H. G. R.

**Determination of  $p_{\text{H}}$  of blood and other biological fluids by the glass electrode.** L. SEEKLES (Biochem. Z., 1936, 288, 402—408).—The application of the glass electrode to the determination of  $p_{\text{H}}$  (with an accuracy of 0.01—0.02) of blood and fluids containing  $\text{CO}_2$  or protein fission-products is described.

F. O. H.

**[In-]applicability of the antimony electrode to the determination of  $p_{\text{H}}$  [of blood].**—See A., I, 96.

**Influence of male and female sexual hormone preparations on blood coagulation.** C. BABLYK (Münch. med. Woch., 1935, 82, 1679; Chem. Zentr., 1936, i, 1246).—Injection of the preps. two months after castration prolonged the coagulation period.

A. G. P.

**Evidence for the presence of a diffusible organic substance in blood which accelerates blood clotting.** C. E. LARSON and D. M. GREENBERG (Proc. Soc. Exp. Biol. Med., 1935, 33, 305—307).—Thoroughly dialysed blood plasma, redissolved in H<sub>2</sub>O containing the known dialysable constituents of blood, including Ca, does not clot until a small quantity of serum ultrafiltrate is added. The active serum constituent is org., and is not species-sp.

W. O. K.

**Structure of natural and synthetic antigens.** M. HEIDELBERGER (Science, 1936, 84, 498—501).—An address.

L. S. T.

**Inhibition of the fixation reaction in presence of Besredka's antigen by the serum fraction precipitable by hydrochloric acid.** C. AUGUSTE and E. RIGAUD (Compt. rend. Soc. Biol., 1936, 123, 917—919).

H. G. R.

**Purified Forssman preparations.** E. BRUNIUS (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 18, 3 pp.).—Purified Forssman hapten (I) preps. contain a carbohydrate. This is probably an NH<sub>2</sub>-sugar (II) on account of the correlation between the amount of (II) and the (I) content in various preps. Acid hydrolysis of (I) yields fatty acids. Cobra venom does not inhibit (I).

E. A. H. R.

**Influence of aminophenylarsinates on the toxin-antitoxin complex.** H. GOLDIE (Compt. rend. Soc. Biol., 1936, 123, 883—887).—The salt is adsorbed by the complex and pptd. in dil. solutions of the toxin, an opalescence appearing in conc. solutions.

H. G. R.

**Resistance to heat of antibodies isolated from serous media.** K. MEYER and A. PIC (Compt. rend. Soc. Biol., 1936, 123, 935—936).—The thermostability of the antibodies is independent of the serum in which they occur.

H. G. R.

**Specific polysaccharide of the type I pneumococcus.** M. HEIDELBERGER and F. E. KENDALL (Proc. Soc. Exp. Biol. Med., 1935, 33, 445—446; cf. following abstract).—The acetylated polysaccharide (I) obtained from type I pneumococcus resembles that obtained by Avery *et al.*, but the  $\eta$  of its solutions is much higher and it ppts. twice as much antibody-N from type I antipneumococcus rabbit serum. The power of acetylated (I) to ppt. antisera from rabbits is diminished by heating but the reaction with antisera from horses is scarcely affected.

W. McC.

**Preparative changes necessitated by a quantitative study of precipitating power of pneumococcus polysaccharides.** M. HEIDELBERGER, F. E. KENDALL, and H. W. SCHERP (Proc. Soc. Exp. Biol. Med., 1936, 33, 188—190).—The method of prep. was modified to avoid possible degradation by acid and the initial concn. of the autolysed cultures at 100° was omitted. The product pptd. up to 50%

more antibody from rabbit serum and had a higher  $\eta$ .

P. G. M.

**Photodynamic action of methylene-blue on diphtheria toxin.** F. C. LIN (Proc. Soc. Exp. Biol. Med., 1935, 33, 337—338).—Hamsters receiving injections of unexposed toxin plus the dye or of exposed toxin without the dye died in  $\approx 3$  days, but those receiving injections of toxin plus dye exposed to sunlight or electric light usually survived. Sunlight is more effective than electric light.

W. McC.

**Hæmolytic complement albumin-globulin ratio.** M. C. TERRY (Proc. Soc. Exp. Biol. Med., 1935, 33, 205—207).—If fresh cell-free guinea-pig serum is repeatedly frozen and thawed in a test-tube, the proteins tend to be conc. in the lower half, which exhibits a higher complement titre and also a higher albumin-globulin ratio than the original serum.

W. O. K.

**Immunological potency of globulin prepared by precipitation with methyl alcohol.** F. T. CHU and C. Y. CHOU (Proc. Soc. Exp. Biol. Med., 1935, 33, 323—326).—Dry globulin (I) obtained from extract of human placenta by pptn. with MeOH is as potent in neutralising Dick toxin and protecting against measles as is (I) obtained by pptn. with (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>.

W. McC.

**Anti-endocrine gland precipitins and longevity in vertebrates.** C. PICADO and W. ROTTER (Compt. rend. Soc. Biol., 1936, 123, 869—871).—The longer is the normal life of the animal the greater is the concn. of precipitin.

H. G. R.

**Effect of ascorbic acid on chemical tests for blood.** J. F. BARRETT (Lancet, 1936, 231, 1214).—Ascorbic acid interferes with the benzidine and guaiacum tests for blood in pathological specimens, which should be boiled, acidified with AcOH, and extracted with Et<sub>2</sub>O before test.

L. S. T.

**Biochemistry of the lens.** D. R. CAMPBELL (Brit. Med. J., 1936, No. 3961, 1133—1136).—A review.

A. G. P.

**Nucleotide nitrogen content of certain tissues of the dog and rabbit.** J. J. EILER and F. W. ALLEN (Proc. Soc. Exp. Biol. Med., 1935, 33, 208—209).—Analytical data are recorded.

W. O. K.

**Determination of pyruvic acid in muscle.** A. HAHN, H. NIEMER, and I. FISCHBACH (Z. Biol., 1936, 97, 582—584).—Modifications in the method of Hahn and Niemer (A., 1934, 796) are described. If hexose diphosphate is present it is pptd. with colloidal Fe after deproteinisation. When methylene-blue (I) is present, it is reduced by H<sub>2</sub>S and on deproteinisation the leuco-(I) remains adsorbed on the muscle residue.

E. A. H. R.

**Highly unsaturated C<sub>28</sub>-fatty acids in Hokke oil.** S. UENO and M. IWAI (Bull. Chem. Soc. Japan, 1936, 11, 643—649).—Oil from *Pleurogrammus monoptyerygius*, Pallas ( $n_D^{20}$  1.4714, acid val. 19.0, sap. val. 183.3, I val. 92.1), yields 1.5% of unsaponifiable matter (cholesterol and oleyl alcohol) and mixed fatty acids among which palmitic, stearic, myristic, arachidic, clupanodonic, behenic, and cetoleic acids are identified. The probable presence of unsaturated

C<sub>24</sub>- (nisinic, scoliodonic), C<sub>26</sub>- (thynnic, sibic), and highly unsaturated C<sub>28</sub>-acids is demonstrated.

F. N. W.

**Total fat content of developing salmon eggs.** F. R. HAYES and D. M. ROSS (Proc. Roy. Soc., 1936, B, 121, 358—375).—The total fat of salmon eggs (embryo + yolk) and larvæ rises slightly until 3—4 weeks after hatching, when it rapidly falls. Of the embryo alone, the total fat rises rapidly at first, falls about 20% at hatching, and then increases to the end of embryonic life. Absorption and combustion of fat occur simultaneously. Close relationships exist between these and similar data for the chick embryo, and a morphological parallel can be drawn with an appropriate time scale.

F. A. A.

**Animal lipins. XI. Reineckate of the polydiaminophosphatide from spleen. XII. Determination of diaminophosphatide in organs and fluids. Application to stromata of red blood cells and serum.** S. J. THANNHAUSER and P. SETZ (J. Biol. Chem., 1936, 116, 527—531; 533—541, cf. A., 1935, 703).—XI. The prep. of the polydiaminophosphatide (I) from bovine spleen, employing a chromatographic adsorption, is described. (I) forms a cryst. compound (II) with reinecke acid (III). (II) is considered to be the reineckate of a trimeric sphingomyelin. Monoaminophosphatides (IV) do not react with (III).

XII. Applications are given of the reineckate method to the separate determination of diaminophosphatide (V) and (IV) in blood stromata and sera. (V) represents 50—66%, (IV) 50—33%, of the total phospholipin from both sources. Other data relating to various clinical conditions are given.

F. A. A.

**Phospholipin fatty acids of muscle.** R. H. SNIDER (J. Biol. Chem., 1936, 116, 503—510).—The total fatty acid of phospholipin of muscle contains 73% of liquid and 27% of solid acids. This ratio, and the I val. of the unsaturated acids, vary little between the various muscles of different animals, and remain unaffected by exercise.

F. A. A.

**Phosphatides. XIII. Highly unsaturated fatty acids of the glycerophosphatides of various organs.** E. KLENCK and J. DITTMER (Z. physiol. Chem., 1936, 244, 203—208; cf. A., 1935, 1265; Ault and Brown, *ibid.*, 233).—Highly unsaturated C<sub>22</sub> acids together with considerably greater amounts of C<sub>20</sub> acids occur in the glycerophosphatides (I) of the heart, spleen, and adrenals of cattle. Probably such acids occur regularly together also in (I) of all other organs.

W. McC.

**Sphingomyelin in Niemann-Pick disease.** C. TROPP and B. ECKARDT (Z. physiol. Chem., 1936, 243, 38—42; cf. Klenk, A., 1935, 1265).—The liver and spleen from a person suffering from the disease (complicated with amaurotic idiocy) contained respectively 19 and 25% of sphingomyelin (I). The liver-(I) had  $[\alpha]^{20}_D + 5.58^\circ$  in CHCl<sub>3</sub> + MeOH and the spleen-(I)  $[\alpha]^{20}_D + 5.86^\circ$ . Hydrolysis of (I) with H<sub>2</sub>SO<sub>4</sub> in MeOH gave lignoceric, palmitic, and stearic acid.

W. McC.

**Glycogen and water storage.** E. M. GREISHEIMER and E. GOLDSWORTHY (Proc. Soc. Exp. Biol.

Med., 1936, 33, 32—34).—In a large group of animals there is good correlation between glycogen and H<sub>2</sub>O contents of the liver, but not between blood-sugar and either of these vals.

P. G. M.

**Unimolecular films of nerve-proteins.** L. FOURT and F. O. SCHMITT (J. Physical Chem., 1936, 40, 989—996).—Surface pressure-area relations have been determined for nerve-protein fractions spread on aq. buffer solutions. Surface potentials have also been measured. A characteristic of all the films studied is a time lag in the establishment of the equilibrium pressure after changing the area, due to readjustment of a temporary unstable orientation of the mols. The results are discussed.

F. L. U.

**Enamel protein.** P. PINCUS (Nature, 1936, 138, 970).—The protein in the enamel of human teeth appears to contain tyrosine but no S, although hitherto believed to be a keratin. The X-ray diagram (W. T. ASTBURY) differs from that given by some keratins.

L. S. T.

**Base-protein-acid compounds.** M. H. FISCHER and W. J. SUEB (Arch. Path., 1935, 20, 683—689; Chem. Zentr., 1936, i, 1433).—It is considered that the modifying action of salts and of H<sub>2</sub>O on proteins is due to real chemical combination; the application of this view to the problem of living matter is discussed.

H. N. R.

**Centrifugal separation of "colloid" from living thyroid gland.** J. F. McCLENDON (Proc. Soc. Exp. Biol. Med., 1935, 33, 413—414).—Prolonged centrifuging (160,000—200,000*g*) causes separation of thyroglobulin from the living thyroid gland (man, pig, rabbit).

W. McC.

**Potentiometric study of flavins.**—See A., I, 85.

**Quantitative theory of membrane permeability.** T. TEORELL (Proc. Soc. Exp. Biol. med., 1935, 33, 282—285).—The theory of permeability of membranes may be developed from the theory of electrolytes by regarding the negative membrane as equiv. to a group of negative immobile ions distributed throughout its vol. Application of equations for the diffusion of electrolytes leads to vals. for the total e.m.f. across a membrane separating NaCl solutions of different concns. which are in general agreement with experimental results.

W. O. K.

**Nature and permeability of grasshopper egg membranes. II. Chemical composition of membranes.** T. L. JAHN (Proc. Soc. Exp. Biol. Med., 1936, 33, 159—163).—An investigation of the chitin of the chorion and cuticle of grasshopper egg membranes.

P. G. M.

**Structure and absorption relationships of the chromosomes of the salivary glands of *Drosophila virilis*.** H. VON EULER, H. HELLSTROM, and K. BRANDT (Arkiv Kemi, Min., Geol., 1936, 12, A, No. 6, 16 pp.; cf. A., 1935, 1266).—The stainable constituent of chromosomes may be identical with the substance which absorbs ultra-violet light after suitable fixation with a moderately acidic solution [alum, picric acid (I), C<sub>5</sub>H<sub>5</sub>N]. The absorbing substance is dissolved out by grinding the glands with

H<sub>2</sub>O, Ringer's solution, glycerol, dil. aq. C<sub>5</sub>H<sub>5</sub>N, and strong acids. The stainable substance adsorbs (I), shows reducing properties after hydrolysis, and adsorbs I after fixation in acids. E. A. H. R.

**Nature, changes in size, and reversibility of chondriosomes.** A. Russo (Atti R. Accad. Lincei, 1936, [vi], 23, 543—545).—The lipin-protein character and physico-chemical processes of chondriosomes and other cellular elements are discussed. F. O. H.

**Evidence for linear units within protoplasm.** H. H. PREIFFER (Nature, 1936, 138, 1054).—A discussion. L. S. T.

**Bee poison. II. Magnesium content of bee poison.** G. HAHN and L. LEDITSCHKE (Ber., 1936, 69, [B], 2764—2765; cf. this vol., 9).—The crystals formed when the crude or purified poison is treated with NH<sub>3</sub> are identified as MgNH<sub>4</sub>PO<sub>4</sub>. Traces of other biologically significant metals are not observed. H. W.

**Micro-determination of lactose in milk.** A. KERN (Biochem. Z., 1936, 288, 375—377).—The milk (0.1 c.c.) is coagulated by Cd(OH)<sub>2</sub> (from CdSO<sub>4</sub> and NaOH), filtered, and lactose determined in the filtrate by heating with K<sub>3</sub>Fe(CN)<sub>6</sub> and iodometric titration of Fe(CN)<sub>6</sub>''' formed. F. O. H.

**Physical chemistry and serological properties of spinal fluid.** N. BERNSTEIN (Arch. Phys. biol. Chim.-Phys. Corps, 1935, 12, 155—179; Chem. Zentr., 1936, i, 1249).—Neutralisation and buffer curves together with cataphoretic and hæmolytic measurements show no characteristic differences between healthy and diseased cases. A. G. P.

**Diastase in rabbit saliva.** I. M. THOMAS (Nature, 1936, 138, 1015—1016).—Rabbit saliva rapidly hydrolyses broken starch grains. The low diastatic activity observed by Schwartz and Rasp (Fermentforsch., 1926, 9, 50) is probably due to adsorption of the enzyme by the cotton-wool used in the collection of the saliva. L. S. T.

**Formation of bile-pigment.** H. T. SCHREUS and C. CARRIÉ (Med. Welt, 1935, 9, 1135—1137; Chem. Zentr., 1936, i, 1453—1454).—Protoporphyrin (I) is produced by the action of liver-pulp on hæmoglobin and hæmatin (optimum *p*<sub>H</sub> 7.0—5.0). At *p*<sub>H</sub> 7.8 formation of (I) declines but pigment appears as a decomp. product. Catalase inhibits pigment formation. The mechanism of these changes is examined. A. G. P.

**Presence of antibody in bile.** J. A. STERLING (Proc. Soc. Exp. Biol. Med., 1935, 33, 251—253).—Dogs immunised with a multivalent vaccine contained antibodies in the hepatic and gall-bladder bile in concns. < in serum. W. O. K.

**Comparison of methods for determination of bile acids in bile. Proportion between the acids.** B. JOSEPHSON and G. JUNGNER (Biochem. J., 1936, 30, 1953—1959).—The colorimetric method, best used in Josephson's modification (A., 1935, 1000), determines only cholic acid and its conjugates including scymnol. Of the gasometric methods only that of Jenke and Steinberg (A., 1930, 1462) gives

satisfactory results. After complete hydrolysis the polarimetric method gives trustworthy results but frequently the solutions are too highly coloured to be used. In biles having taurocholic acid (I) as the only S constituent combined S and total N determinations permit distinction between (I) and glycocholic acid. W. McC.

**Nitrogen content of the bile.** H. G. ARONSOHN and E. ANDREWS (Proc. Soc. Exp. Biol. Med., 1936, 33, 85—87).—Total N of dog bile averages 0.34%. No correlation exists between total N and various diseased states. P. G. M.

**Oxidation product of urobilin.**—See A., II, 36.

**Reactions of pregnancy urine.** P. E. SIMOLA and R. NÄRVÄNEN (Suomen Kem., 1936, 9, B, 29—30).—Urine treated with a 5% solution of I in EtOH, until the colour of I just persists, when boiled affords a reddish colour sol. in C<sub>5</sub>H<sub>11</sub>·OH. Positive results are obtained from 80% of pregnancy and 19% of normal urines. Histidine is not responsible for the colour. J. L. D.

**Relation between excretion of urea and creatinine and rate of urine production in the dog.** J. A. SHANNON (Proc. Soc. Exp. Biol. Med., 1935, 33, 474—476).—The rate of excretion of urea increases as the rate of production of urine increases, no limiting val. being attained. The rate of excretion of creatinine is scarcely affected by that of urine production. W. McC.

**Significance of C<sub>3</sub> substances in urine.** A. P. SUÑER (Compt. rend. Soc. Biol., 1936, 123, 859—862).—C<sub>3</sub> substances are connected with carbohydrate metabolism, but no parallelism was observed between their secretion and glycosuria or ketonuria. H. G. R.

**Composition of glomerular urine. XIV. Glomerular excretion of inulin in frogs and necturi.** J. P. HENDRIX, B. B. WESTFALL, and A. N. RICHARDS (J. Biol. Chem., 1936, 116, 735—747).—A method for the micro-determination of inulin (I) based on the determination of sugars after acid hydrolysis (cf. Walker *et al.*, A., 1933, 250), is described. Intravenously injected (I) is excreted in the glomerular urine of frogs and necturi in a concn. equal to that in the plasma. The glomerular process is probably one of filtration only. As (I) has the largest mol. of all normal urinary constituents, its size gives an approx. measure of the pore-size of the glomerular membrane. E. A. H. R.

**Colorimetric determination of *p*<sub>H</sub>.**—See A., I, 96.

**Deterioration of materials due to [human] sweat.** H. PRIESS and O. KAUFKE (Chem.-Ztg., 1936, 60, 1017).—The principal agent bringing about deterioration of clothing by sweat is NH<sub>3</sub>, produced by the bacterial decomp. of urea, of which sweat contains 0.1—0.5%. A. B. M.

**Addison's disease (functional renal failure).** C. JIMENEZ-DIAZ (Lancet, 1936, 231, 1135—1139).—An address. L. S. T.

**Effect of adrenaline on blood-sugar and -lactic acid in Addison's disease and in adrenalectomised dogs.** I. ANDERSON (Proc. Soc. Exp. Biol. Med., 1935, **33**, 349—356).—Subcutaneous injection of adrenaline (I) increases blood-sugar (II) in disease as in health, the curve having the same contour in both cases. The blood-lactate (III) curve remains high in disease longer than in health possibly because the liver is slow in converting (III) into glycogen. The (II) and (III) curves following a single intravenous injection of (I) into adrenalectomised dogs are lower and tend to remain elevated longer than in the same dogs before removal of the second adrenal gland. W. McC.

**Agranulocytosis and amidopyrine.** S. C. DYKE (Brit. Med. J., 1936, No. 3957, 911—914).—Ingestion of amidopyrine or related compounds containing the  $C_6H_6$  and substituted pyrazolone rings induces agranulocytosis in sensitive subjects who have passed the change of life. Susceptibility is associated with changes in the nature or balance of sex hormones. A. G. P.

**Effect of iron on hæmoglobin regeneration in gastrectomised dogs.** C. A. DRAGSTEDT, J. D. BRADLEY, and F. B. MEAD (Proc. Soc. Exp. Biol. Med., 1936, **33**, 58—60).—Both the spontaneous and induced anæmia of gastrectomised dogs is microcytic, and responds to Fe but not to liver therapy. P. G. M.

**Glutathione content of blood in nutritional anæmia.** M. O. SCHULTZE and C. A. ELVERJEM (J. Biol. Chem., 1936, **116**, 711—716).—In nutritional anæmia of rats, the reduced glutathione (I) content of the red cells falls to low levels. On feeding both Fe and Cu there is a rapid rise of the reduced (I) content to normal vals. Normally 90—100% of the total (I) is in the reduced form but <50% in nutritional anæmia. In nutritional anæmia of pigs both total and reduced (I) contents of the red cells increase. E. A. H. R.

**Age and rate of decrease of red blood-cells before and after liver treatment of pernicious anæmia.** L. S. ORNSTEIN and J. F. SCHOUTEN (Proc. K. Akad. Wetensch. Amsterdam, 1936, **39**, 1079—1088).—A relation is established between the change in serum-bilirubin in pernicious anæmia during liver treatment and laws governing the death rate of red cells. A. G. P.

**Biological evaluation of anti-anæmia liver preparations.** K. ZIPF and P. GOTTLIBE (Arch. exp. Path. Pharm., 1936, **184**, 71—73).—By intravenous injection into rabbits of saponin along with colloidal Ag (collargol) or Fe (electroferrol) an anæmia resembling pernicious anæmia in man is established and remains const. for 1 month. Animals so treated can be used for assay of liver preps. P. W. C.

**Morphology and chemistry of blood of cattle in health and during anaplasmosis.** C. W. REES and M. W. HALE (J. Agric. Res., 1936, **53**, 477—492).—During the incubation period of infected bulls blood changes were small. The clinical stage is associated with a decrease in red and an increase in white cells, lowered hæmoglobin and  $O_2$ -capacity in

blood. Sugar, P, serum-protein, Ca, and urea were unaffected. Serum-bilirubin increased. A. G. P.

**Ionised blood-calcium in patients with renal calculi.** H. POLLACK and M. REINER (Proc. Soc. Exp. Biol. Med., 1935, **33**, 432—433).—In 24 cases of renal calculi there was no accompanying increase in the  $Ca^{++}$  content of the blood. M. McC.

**Cancer research in Great Britain.** ANON. (Nature, 1936, **138**, 999—1000). L. S. T.

**Cancer as a metabolism problem.** W. BRANDT (Chem.-Ztg., 1936, **60**, 1033—1035).—A survey.

**Disposition towards cancer : its diagnosis and prevention.** G. KLEIN (Arch. Klin. Chirurg., 1935, **183**, 194—202; Chem. Zentr., 1936, **i**, 1241—1242).—Use is made of the substance present in serum which effects lysis of tumour cells. A. G. P.

**Chemistry of carcinoma. III.** A. VON CHRISTIANI (Z. Krebsforsch., 1935, **42**, 317—323; Chem. Zentr., 1936, **i**, 1637; cf. A., 1936, 1538).—The "carcinoma intestinal acid" (Freund and Kammer) is identified as a mixture of palmitic and stearic acids. In carcinoma cases sera contain less cholesterol ester-splitting enzymes than normal. The esters protect cancer cells from cytolysis. A. G. P.

**Influence of pregnancy hormone on the development of epithelial tumours.** F. SAVIGNONI (Rass. Clin. Terap., **32**, 349—363; Chem. Zentr., 1936, **i**, 1445).—Pregnancy urine contains a hormone which inhibits the growth of Herlich adenocarcinoma. A. G. P.

**Non-bacterial cholecystitis. Mechanism of acidification of bile in the gall bladder.** H. G. ARONSOHN and E. ANDREWS (Proc. Soc. Exp. Biol. Med., 1936, **33**, 89—91).—The marked rise in P content and the increased concn. of protein > balance the loss of  $Cl^-$  and account for the acidification of gall-bladder bile; increase of bile acid concn. also contributes slightly to this effect. P. G. M.

**Sexual function in relation to water economy and especially to diabetes insipidus.** L. BELTRAMETTI (Endokrinol., 1935, **16**, 241—256; Chem. Zentr., 1936, **i**, 1445).—The antipolyuretic action of folliculin is examined. A. G. P.

**Plasma magnesium and potassium in epilepsy.** A. D. HIRSCHFELDER and V. G. HAURY (Proc. Soc. Exp. Biol. Med., 1936, **33**, 40—42).—Plasma-Mg, -K, and -Ca were normal in epileptics who were not in convulsions. Oral administration of  $MgCl_2$  did not lessen nor did that of KCl increase the frequency of attacks. P. G. M.

**Free and combined purines of the blood in gout.** F. COSTE, A. GRIGAUT, and A. MANDE (Compt. rend. Soc. Biol., 1936, **123**, 1078—1081).—Total blood-purine is increased in gout, but little variation is observed in the ratio of free to combined purine. H. G. R.

**Hæmophilia.** W. A. TIMPERLEY, A. E. NAISH, and G. A. CLARK (Lancet, 1936, **231**, 1142—1149).—A substance extracted from egg-white incubated at 37° for several days in presence of KBr reduces the clotting time of blood and controls hæmorrhage in

haemophilics. A derivative of mucic acid has similar properties. L. S. T.

**Bile acids in icterus produced by tolylenediamine.** J. M. MCGOWAN, J. L. BOLLMAN, and F. C. MANN (*J. Pharm. Exp. Ther.*, 1936, **58**, 305—311).—Jaundice produced by tolylenediamine in dogs resembles obstructive jaundice in the accompanying decrease of bilirubin and bile acids (I) in the bile and their appearance in the blood and urine. Intense hyperbilirubinemia occurs. The continued formation of (I) shows that this function of the liver is unimpaired. E. M. W.

**Alterations in serum-proteins as an index of liver failure.** E. F. FOLEY, R. W. KEETON, A. B. KENDRICK, and D. DARLING (*Proc. Soc. Exp. Biol. Med.*, 1935, **33**, 430—431).—In grave liver injury the albumin (I) content of the blood-serum is diminished and the globulin (II) content increased, the (I) : (II) ratio being reversed. W. McC.

**Clinical significance of cholesterol distribution in plasma in hepatic and biliary diseases.** E. Z. EPSTEIN and E. B. GREENSPAN (*Arch. Int. Med.*, 1936, **58**, 860—890).—Data for the levels of plasma-cholesterol and -cholesteryl ester in hepatic and biliary diseases are tabulated and their significance in diagnosis is discussed. F. O. H.

**Therapeutics of malaria.** A. R. FILKO (*Rev. Sytiatrica*, 1936, **29**, 215—249).—A review and discussion.

[Chemistry of] antimalarials. I, II.—See A., II, 33.

[Blood] complement titre in acute nephritis. C. E. KELLETT (*Lancet*, 1936, **231**, 1262—1265).—A method for the determination of blood complement is described. In acute glomerulonephritis the blood complement is < normal. L. S. T.

**Paget's disease.** Relative constancy of serum phosphatase over periods up to two years. A. B. GUTMAN and E. B. GUTMAN (*Proc. Soc. Exp. Biol. Med.*, 1936, **33**, 150—153).—The increased serum phosphatase in Paget's disease is not affected by radiotherapy, irrespective of any benefit resulting from treatment. P. G. M.

**Hormonal diagnosis of pregnancy in the mare.** J. RICHTER and K. GEHRING (*Berlin. tierarztl. Woch.*, 1935, **51**, 829—832; *Chem. Zentr.*, 1936, i, 1648—1649). H. J. E.

**Mandelic acid in the treatment of pyelitis in childhood.** G. H. NEWNS and R. WILSON (*Lancet*, 1936, **231**, 1087—1089).—The acid appears to be an effective remedy for *B. coli* pyelitis in children. L. S. T.

**Bee venom in rheumatic disorders.** F. S. MACKENNA (*Lancet*, 1936, **231**, 1212—1213).—"Apicur," a bee venom prep., has a beneficial effect. L. S. T.

**Protein metabolism and oxidative processes in experimental scurvy.** V. Specific protein metabolism of muscle of scorbutic guinea-pigs. L. D. KASHEVNIK (*Biochem. Z.*, 1936, **288**, 409—413; cf. A., 1936, 369).—Scurvy in guinea-pigs is accompanied by a diminution in the contents of N

and protein constituents of skeletal and cardiac muscle and an increase in the H<sub>2</sub>O-sol. N fraction. The proteins of cardiac muscle appear to be more stable than those of skeletal muscle. F. O. H.

**Epidemiological aspects of silicosis and tuberculosis.** A. S. POPE and D. ZACKS (*Amer. Rev. Tuberc.*, 1935, **32**, 229—242).—The incidence of the diseases among granite and foundry workers is examined. CH. ABS. (*p*)

**Measurement of reagin in non-syphilitic sera.** C. W. BARNETT, R. B. JONES, and G. V. KULCHAR (*Proc. Soc. Exp. Biol. Med.*, 1935, **33**, 214—218).—Non-syphilitic sera regularly contain small quantities of reagin (the substance assumed to be responsible for a positive Wassermann reaction) as tested for by a modified application of the Kline reaction. W. O. K.

**Retarding action of subcutaneous injections of ethyl laurate, stearate, or palmitate on experimental tuberculosis in guinea-pigs.** L. NEGRE, A. BERTHELOT, and J. BRETEY (*Compt. rend. Soc. Biol.*, 1936, **123**, 864—865). H. G. R.

**Alkali poisoning in the treatment of gastric ulcer.** C. L. COPE (*Brit. Med. J.*, 1936, No. 3957, 914—917).—Alkali poisoning resulting from ingestion of alkalis in treatment of gastric ulcers is associated with casts and albumin in urine, high blood-urea and -p<sub>H</sub>, increased N retention involving total non-protein-N of blood and plasma-creatinine, increased plasma-PO<sub>4</sub><sup>'''</sup>, -Cl', and alkali reserve. A. G. P.

**Mandelic acid in the treatment of urinary infections.** M. L. ROSENHEIM (*Lancet*, 1936, **231**, 1083—1087). L. S. T.

**Oxygen consumption of mayfly nymphs in relation to available oxygen.** H. M. FOX, C. A. WINGFIELD, and B. G. SIMMONDS (*Nature*, 1936, **138**, 1015—1016).—Wide variations in O<sub>2</sub> consumption in relation to O<sub>2</sub> available in the H<sub>2</sub>O are shown by different species. In some, O<sub>2</sub> intake falls immediately the O<sub>2</sub> in the environment falls, in others it does not fall until available O<sub>2</sub> has reached a low val. When O<sub>2</sub> in excess of the normal amount is available, *Baetis* sp. increases its consumption by 50%, whilst other species make little or no response. L. S. T.

**Significance of fumaric acid for the respiration of animal tissues.** III. (A) Introduction, review, methods. A. SZENT-GYÖRGYI. (B) Quantitative investigation of catalysis by fumaric acid. F. B. STRAUB. (C) Interaction of oxalacetic acid, hydrazine, and nitrous acid. V. BRUCKNER. (D) Oxidation of fumaric acid and reduction of oxalacetic acid by muscle pulp. I. BANGA. (E) Reduction of oxalacetic acid in embryonal tissue. A. BLAZSÓ. (F) Decarboxylation of oxalacetic acid by muscle. F. B. STRAUB. (G) Hydrogen donator of oxalacetic acid reduction in muscle. K. LAKI. (H) Catalysis by fumaric acid and behaviour of pyruvic acid in liver. E. ANNAU. (I) Function of succinodehydrogenase. K. LAKI (*Z. physiol. Chem.*, 1936, **244**, 105—116, 117—127, 127—130, 130—137, 138—139, 140—141, 142—144, 145—149, 149—152).—(A) Trustworthy results are obtainable only when quant.

micro-methods are employed and time intervals  $>10$  min. are considered. It is suggested that in fermentation  $\text{AcCO}_2\text{H}$ , and in respiration oxalacetic acid (I), are the H acceptors but that otherwise the processes are identical. The enzymes of fermentation and respiration seem to act indirectly, not attacking carbohydrate but acting on malic (II) and lactic acid (III). Within certain limits the amount of (I) which disappears is a measure of the amount reduced and hence of the extent of respiration.

(b) The  $\text{AcCO}_2\text{H}$  of 1 ml. of suspension (deproteinised with Na tungstate +  $\text{H}_2\text{SO}_4$ ) of pigeon's breast muscle (containing  $>0.5$  mg. of  $\text{AcCO}_2\text{H}$ ) is determined by adding 1 ml. of aq. KOH (100 g. in 60 ml. of  $\text{H}_2\text{O}$ ) and 0.5 ml. of solution of 2 vols. of  $\alpha\text{-OH-C}_6\text{H}_4\text{-CHO}$  in 100 ml. of 96% EtOH, maintaining for 10 min. at  $37^\circ$ , cooling to room temp., removing  $\text{K}_2\text{SO}_4$  by centrifuging, and measuring with a photometer the depth of colour (due to the production of  $\alpha$ -hydroxybenzylidenepyruvic acid) produced in  $>1$  hr. (I) does not interfere but if it is present the determination must be made as soon as possible since (I) readily changes into  $\text{AcCO}_2\text{H}$ . About 20% of the  $\text{AcCO}_2\text{H}$  remains bound to the protein and allowance is made for this. The average error is 10%. The spontaneous decarboxylation of (I) is a unimol. reaction with max. at  $p_{\text{H}}$  2—3. No decarboxylation occurs in strongly alkaline solutions. For the determination of (I) in the muscle 1 ml. of the deproteinised filtrate [containing  $>2$  mg. of (I)] is treated with 1.4 ml. of a solution of 3.5 g.  $\text{N}_2\text{H}_4 + \text{HCl}$  in 30 ml.  $\text{H}_2\text{O} + 100$  ml. of 96% EtOH. The mixture is maintained at  $37^\circ$  for 15 min., cooled in ice for 3 min., and treated with 0.1 ml. of saturated aq.  $\text{NaNO}_2$ . After 5 min. 1 ml. of aq. KOH (100 g. in 60 ml. of  $\text{H}_2\text{O}$ ) is added,  $\text{K}_2\text{SO}_4$  is removed by centrifuging, and the depth of colour produced by the yellow K salt of 4-nitrosopyrazolone-3-carboxylic acid (IV) is measured with a photometer. Part of the (I) remains bound to the protein and a correction must be applied. l-Malic acid (V) is determined in 15—20 ml. of the deproteinised filtrate by neutralising with  $\text{Na}_2\text{CO}_3$  ( $p_{\text{H}}$  3—8), adding about 0.6 g. of  $\text{UO}_2(\text{OAc})_2$  for each 10 ml. of solution, separating  $\text{UO}_2(\text{HPO}_4)_2$  by filtration, and determining  $[\alpha]_D$ , which is increased to about  $-45^\circ$ . A correction is applied for (V) bound to protein. The error is  $+10\%$ . (III) in the concns. found in muscle does not interfere. Procedures and apparatus for the micro-determination of  $\text{CO}_2$  and R.Q. are described [e.g., for catalytic decarboxylation of (I) with  $\text{NH}_2\text{Ph}$  by Ostern's method (A., 1933, 964)].

(c) Hydroxyfumaric acid (VI) [which changes into (I) in  $\text{H}_2\text{O}$ ] with  $\text{N}_2\text{H}_4 + \text{HCl}$  gives pyrazolone-3-carboxylic acid (VII) (in absence of HCl the yield is low since spontaneous decarboxylation occurs) and (VII) with  $\text{NaNO}_2$  gives 4-oximinopyrazolone-3-carboxylic acid. The hydrazone of (I) cannot be isolated.

(d) In 4 ml. of muscle suspension containing added fumaric acid (VIII) the max. amount of (I) is obtained by incubation with 20 mg. of  $\text{N}_2\text{H}_4 + \text{HCl}$ . Activation of (VIII) is inhibited by  $>40$  mg. of  $\text{N}_2\text{H}_4$ . No (I) is obtained by incubation with (VIII) alone and little by incubation with (VIII) +  $\text{AsO}_3^{'''}$ .

Under aerobic and anaerobic conditions about 80% of (I) which disappears is recovered as (VIII) (II). Fixation of (I) by  $\text{N}_2\text{H}_4 + \text{HCl}$  is max. in about 10 min. and reduction of (I) is most intense during the first 5 min. Rat's muscle reduces (I) to the same extent as does pigeon's muscle, but rat's and rabbit's liver have less reducing power and tumour tissues little or none.

(e) The respiration of the muscle of young ( $>28$  days old) and unborn rats is about  $33\% <$  that of the muscle of adult rats. (I) is not attacked by the embryonal muscle or by muscle from rats  $< 14$  days old and added (VIII) does not increase the  $\text{O}_2$  uptake in muscle  $< 10$  days old. Succinic acid (IX) stimulates respiration of the muscle equally at all ages. Added  $\text{AcCO}_2\text{Na}$  is slightly attacked by the muscle at all ages, the amount which disappears not being increased by separate addition of NaF and hexose diphosphate, but when these are added together after the 14th day the amount is greatly increased. The disappearance of added (I) after the 14th day and that of added  $\text{AcCO}_2\text{H}$  proceed in parallel, indicating that the system which activates the hexose (or triose produced from it) by dehydrogenation is responsible for both processes. At all ages added glutamic acid causes rapid disappearance of (I).

(f) (II) added to the muscle is not attacked and can be quantitatively recovered after 30 min. At the same time (II) increases the  $\text{O}_2$  uptake by 100%. No (I) or  $\text{AcCO}_2\text{H}$  is produced. The rate of spontaneous decarboxylation of (I) is doubled by addition of washed boiled muscle pulp. In 4 ml. of muscle suspension 10 min. after addition of 20 mg. of (I), 15.5 mg. of (I), 1.9 mg. of  $\text{AcCO}_2\text{H}$ , and 4.7 mg. of (VIII) + (II) are found. Hence decarboxylation of (I) proceeds so slowly that the process plays no significant part in intermediary metabolism.

(g)  $\text{AcCO}_2\text{H}$  added to suspension of muscle rapidly disappears, but the disappearance is accompanied by rapid reduction of added (I), (VIII) + (II) being produced in approx. equiv. amounts. When  $\text{AsO}_3^{'''}$  is present reduction of (I) is much less and the amount of (VIII) +  $\text{AcCO}_2\text{H}$  is at first equiv. to the amount of (I) which disappears. Hence  $\text{AcCO}_2\text{H}$  is not produced by decarboxylation of (I). Later the amount of  $\text{AcCO}_2\text{H}$  produced is  $>$  equiv. to the (I) reduced and the (VIII) + (II) produced since  $\text{AcCO}_2\text{H}$  is produced by the muscle. In muscle extract similar results are obtained.

(h) The  $\text{O}_2$  uptake of minced liver is usually increased by addition of (VIII) and  $\text{AcCO}_2\text{H}$  and always increased by that of (VIII) +  $\text{AcCO}_2\text{H}$ . When (VIII) is present 1 O, when it is absent  $< 1$  O, is consumed for each mol. of  $\text{AcCO}_2\text{H}$  which disappears. When, owing to lack of (VIII), oxidation of  $\text{AcCO}_2\text{H}$  is incomplete  $\text{COMe}_2$  is produced but not if (VIII) is present. The amount of  $\text{AcCO}_2\text{H}$  which disappears is not affected by presence or absence of (VIII). The  $\text{O}_2$  consumption is affected by added alanine in the same way as by added  $\text{AcCO}_2\text{H}$ .

(i) Succinodehydrogenase (from horse flesh) when free from fumarase oxidises (IX) to (VIII) and activates (VIII), which serves as H donator, but not (II).

W. McC.

**Effect of fumarate on respiration.** F. J. STARE and C. A. BAUMANN (Proc. Roy. Soc., 1936, B, 121, 338—357).—Manometric measurements show that fumarate (I) and other 4-C acids increase the  $O_2$  uptake of pigeon breast muscle, and that (I) removes inhibition by malonate. Tissue extract also increases the  $O_2$  uptake, and with (I), restores the activity of ground muscle to normal. The action of fumarate appears to be primarily catalytic. F. A. A.

**Effect of fumarate on the respiration of liver and kidney.** F. J. STARE (Biochem. J., 1936, 30, 2257—2261; cf. this vol., 60).—The respiration of rabbit's liver and kidney is increased by addition of fumarate (I) and inhibited by that of malonate. Added (I) is converted into oxalacetate (II) and added (II) disappears, being converted into an equilibrium mixture of (I) and malic acid. Szent-Gyorgyi's theory of (I) catalysis of respiration in muscle thus applies to liver and kidney also.

W. McC.

**Metabolic mechanism and nutrition in relation to the systematic classification of man as herbivorous, carnivorous, or omnivorous.** A. BICKEL and L. GEREZ (Chem.-Ztg., 1936, 60, 996—997).—A lecture.

A. G. P.

**Effect of feeding goats' milk to rats.** W. OCHSE (Z. ges. exp. Med., 1935, 97, 252—264; Chem. Zentr., 1936, i, 1250).—Goat milk produced in rats disturbances of growth processes and a modified blood picture, frequently with hypochromic anaemia.

A. G. P.

**Growth factor required by chicks. Essential nature of arginine.** A. ARNOLD, O. L. KLINE, C. A. ELVEHJEM, and E. B. HART (J. Biol. Chem., 1936, 116, 699—709; cf. Kline *et al.*, A., 1934, 1417).—The growth-promoting factor (I) in  $H_2O$ -extracted liver residue, required by growing chicks, becomes  $H_2O$ -sol. on alkaline hydrolysis. (I) is arginine (II) as there are similar responses in growth when (I) is replaced by proteins rich in (II) and by (II) salts. (II) is therefore an essential  $NH_2$ -acid for growing chicks; after 6 weeks the growth-promoting effect decreases.

E. A. H. R.

**Bioassay of protein supplements fed to chicks.** S. F. COOK and K. G. SCOTT (Proc. Soc. Exp. Biol. Med., 1936, 33, 167—170).—When fish meal (10—20%) replaced casein or skim milk in an otherwise adequate diet the chicks developed anaemia, haemorrhages, and a prolonged blood-clotting time.

P. G. M.

**Relation of glycogen, fat, and protein to water storage in liver.** A. KAPLAN and I. L. CHAIKOFF (J. Biol. Chem., 1936, 116, 663—683).—Determinations of glycogen (I), fat (II), protein, and  $H_2O$  in the livers of depancreatized and/or hypophysectomized, phloridzinized, thyroid-fed, and normal dogs showed that deposition of (I) and (II) in the liver is not accompanied by measurable amounts of  $H_2O$ . Large amounts of (II) in liver do not interfere with storage of (I). The  $H_2O$  content of the liver  $\propto$  a definite protein-containing fraction.

J. N. A.

**Digestibility of kao-liang.** C. F. WANG (Chinese J. Physiol., 1936, 10, 645—650).—The coeffs. of

digestibility of protein, fat, and carbohydrate in a diet consisting mainly of kao-liang, tested on four Chinese accustomed to such a diet, are 83.9, 92.3, and 99.5%, respectively.

F. A. A.

**Determination of apparent digestibility of green and cured grass by modified procedures.** J. C. KNOTT, H. K. MURER, and R. E. HODGSON (J. Agric. Res., 1936, 53, 553—556).—The rapid method of Gallup and Kuhlmann (A., 1931, 868), using  $SiO_2$  in food and faeces as an index of digestibility, was difficult of application owing to contamination with dust or with soil. A modification of Bergeim's method (A., 1926, 1170), using Fe as an index, gave results differing significantly from those of standard practice. The passage of ingested Fe through the digestive system of ruminants is not uniform.

A. G. P.

**Biological values of mixed cereal and legume proteins.** T. H. LAN (Chinese J. Physiol., 1936, 10, 637—643).—The proteins of various cereal-legume mixtures, tested on rats at 10% level, give biological vals. of 73—77. A mixture of corn, millet, and soya bean gives the val. 73 (cf. Adolph and Cheng A., 1935, 1405).

F. A. A.

**Reproductive capacity of female rats as affected by kinds of carbohydrates in the ration.** C. H. WHITNAH and R. BOGART (J. Agric. Res., 1936, 53, 527—532).—A ration containing sucrose was inadequate for normal reproduction even when replaced in adult life by a normal ration. Ovarian abnormalities in these animals indicate pituitary disturbance. Rations containing lactose and starch permitted normal reproduction.

A. G. P.

**Effect of added purines on uric acid production by isolated tissues of the rat.** H. BORSOOK and C. E. P. JEFFREYS (Proc. Soc. Exp. Biol. Med., 1936, 33, 1—2).—The intestinal mucosa and liver account for most of the uric acid production from added purines.

P. G. M.

**Urinary creatine, sulphur, phosphorus, and chlorine during fasting and alimentation.** (A) V. ZAGAMI. (B) V. ZAGAMI and V. CAPRARO. (C) V. ZAGAMI (Atti R. Accad. Lincei, 1936, [vii. 23 629—635, 635—640, 700—706].—The levels in rats during periods of fasting and of feeding on various diets are tabulated and discussed.

F. O. H.

**Inulin and creatinine clearances in dogs. Late effects of uranium poisoning.** A. N. RICHARDS, B. B. WESTFALL, and P. A. BOTT (J. Biol. Chem., 1936, 116, 749—755).—In normal dogs, injected inulin and creatinine are excreted solely (by glomerular filtration) at the same rate with respect to their concns. in plasma.

E. A. H. R.

(A) Metabolism of bromobenzene in growing dogs and mice maintained on adequate diets (B) Synthesis of *p*-bromophenylmercapturic acid by fasting growing dogs. J. A. STEKOL (Proc. Soc. Exp. Biol. Med., 1936, 33, 115—119, 119—121).—(A) Growing dogs and mice can synthesise *n*-bromophenylmercapturic acid (I) from PhBr. (I) is present in urine as long as the neutral S remains > normal. 120—130 mg. can be isolated per g. of PhBr fed to Dalmatian pups.

(b) Fasting growing dogs can synthesise (I) and are capable of supplying cystine for detoxication purposes at the expense of tissue. P. G. M.

**Metabolism of benzene, anthracene, and phenanthrene in adult and growing dogs.** J. A. STEKOL (Proc. Soc. Exp. Biol. Med., 1936, **33**, 170—171).—All three hydrocarbons produce an increase in urinary glucuronates.  $C_6H_6$  and phenanthrene increase the neutral S of the urine, whilst  $C_6H_6$  and anthracene promote ethereal sulphate formation. P. G. M.

**Fat metabolism.** S. SKRAUP (Chem.-Ztg., 1937, **61**, 65—67).—A review.

**White rats as experimental animals in the study of the soft-fat problem.** H. E. ROBINSON, R. E. GRAY, and R. C. NEWTON (Food Res., 1936, **1**, 413—418).—Rats show body-fat formation parallel to that of hogs when fed on similar diets. Saturated fats tend to offset the effects of soya-bean and peanut oils on the body fat of rats. P. G. M.

**Mechanism of carbohydrate oxidation.** F. DICKENS (Nature, 1936, **138**, 1057).—Evidence suggesting that the first stage in the biological oxidation of carbohydrate is its conversion to glucose-6-phosphoric acid (or Robison ester), which is oxidised to 6-phosphogluconic acid (I), is advanced. Dehydrogenation by a sp. dehydrogenase co-enzyme system yields 6-phosphoketogluconic acid, which is then decarboxylated by different routes in animal tissues and in yeast. Phosphohexonic dehydrogenase, isolated from yeast, is active only after addition of Warburg oxidation co-enzyme and yellow enzyme, when the  $O_2$  uptake with (I) at  $37.5^\circ$  is theoretical for dehydrogenation to ketogluconic acid. Indophenol oxidase and cytochrome probably take part in biological oxidation of carbohydrate by this system. L. S. T.

**Ketosis. VIII. Oxidation of ethyl esters of fatty acids.** H. J. DEUEL, jun., L. F. HALLMAN, J. S. BUTTS, and S. MURRAY (J. Biol. Chem., 1936, **116**, 621—639; cf. A., 1936, 235).—Administration of Et acetoacetate, butyrate, and hexoate to fasting rats caused a uniform ketonuria which was somewhat < that produced by the Na salts. More than twice the ketonuria was observed after feeding Et octoate, decaate, laurate, and myristate, and an even greater amount was found after feeding Et palmitate and stearate (both in oil) and Et oleate without oil. With the last 3 acids, decomp. into three parts capable of producing "acetone" bodies probably occurs, whilst the lower acids break up into only two parts. No appreciable ketonuria followed administration of Et propionate, valerate, heptoate, nonoate, and undecoate. Hexoic and butyric acids as well as the odd-no. C acids probably break down chiefly by  $\beta$ -oxidation, whilst the even-no. C acids. (8—14 C) are degraded by  $\delta$ - and  $\zeta$ -oxidation.  $COMe_2$  is the only important ketone found after administration of higher even-no. C acids. J. N. A.

**Ketosis in primates.** W. GOLDFARB (J. Biol. Chem., 1936, **116**, 787—791).—The calc. amounts of  $COMe_2$  that should be excreted by phloridzinised monkeys, assuming a ketogenic-antiketogenic ratio of 2 : 1, agree with the amounts recovered in the urine.

Complete oxidation of ketogenic substances therefore probably requires the simultaneous oxidation of a definite proportion of antiketogenic foodstuffs.

E. A. H. R.

**Ketogenesis-antiketogenesis. V. Metabolism of ketones.** N. L. EDSON and L. F. LEOIR (Biochem. J., 1936, **30**, 2319—2332).—The aerobic and anaerobic metabolism of ketones in rat, pigeon, and guinea-pig tissues is investigated by means of the slice technique.  $AcCO_2Na$  and fructose accelerate the anaerobic disappearance of  $CH_3Ac \cdot CO_2H$  (I) in liver but have no marked influence in other tissues except pigeon's kidney. Malonate (II) and hydroxymalonate (III) do not inhibit oxidation of  $OH \cdot CHMe \cdot CH_2 \cdot CO_2H$  (IV) to (I) but (II) prevents aerobic breakdown of (IV). Since (II) also acts as a sp. inhibitor of succinic dehydrogenase, aerobic metabolism of ketones is probably linked with succinic acid oxidation. (III), mesoxalate, tartrate,  $C_2O_4^{''}$ , and  $NH_3$  cause little depression of respiration and only slightly inhibit the disappearance of (I).

P. W. C.

**Inhibition of lactic acid formation in the cell by oxygen.** A. HAHN, H. NIEMER, and H. HEITING (Z. Biol., 1936, **97**, 578—581).—A prep. of the substance present in muscle, which catalyses the  $O_2$  inhibition of lactic acid formation (Hahn and Niemer, A., 1936, 1017), is obtained by deproteinisation of a  $PO_4^{'''}$  extract of muscle with  $COMe_2$  followed by pptn. with  $Ba(OAc)_2$ . E. A. H. R.

**Non-specificity of the chloride-impoverishing mechanism of small intestine.** R. C. INGRAHAM (Proc. Soc. Exp. Biol. Med., 1935, **33**, 453—455).—In dogs in which the  $[Br^-]$  in the blood-plasma has been increased by administration of  $NaBr$ ,  $Cl^-$  and  $Br^-$  placed in an intestinal loop in concn. < in the plasma move from the intestine into the blood.

W. McC.

**Toxic action and excretion of iodide. Principle of Le Chatelier.** O. EICHLER (Arch. exp. Path. Pharm., 1936, **184**, 82—84).—Frogs were injected each with 10.7 c.c. of 2*M*- $NaI$  and after varying lengths of time were killed and analysed.  $I^-$  appeared initially to be absorbed by muscle and later slowly eliminated. Various explanations of the variation in  $I^-$  content of blood, urine, and muscle are examined. P. W. C.

**Water balance. I. Excessive oxygen usage response of dehydrated animals to water and electrolytes. II. Anoxæmic factor in water intoxication.** H. A. DAVIS (Proc. Soc. Exp. Biol. Med., 1935, **33**, 242—244, 245—246).—I. The rise in  $O_2$  consumption in dogs under Na barbital anaesthesia following the administration of large vols. of 0.9% aq.  $NaCl$  is greater and more prolonged in animals suffering from anhydræmia than in normals.

II. Changes in blood-hæmoglobin, blood- $O_2$ , and  $O_2$  consumption rate following administration to dogs of excessive quantities of 0.9% aq.  $NaCl$  or 5% aq. glucose suggest that symptoms of  $H_2O$  intoxication are partly the result of anoxæmia. W. O. K.

**Physiological potency of dilute traces.** (Sir) J. LARMOR (Nature, 1936, **138**, 929—930).—A discussion. L. S. T.

**Oxidative catalysis in the living cell.** P. JOYET-LAVERGNE (Compt. rend., 1936, 203, 1020—1022).—Catalysis of intracellular oxidation-reduction occurs in the chondrioma and is connected with the vitamin-A and glutathione content. H. G. R.

**Effect of X-rays on the chemical constitution of [human] blood.** A. JANKOVIC (Rep. III Congr. Slav. Pharm., 1934, 281—292).—The concns. of cholesterol, Fe, and other components increase during the irradiation. J. J. B.

**Reductions in irradiated skin.** P. WELLS (Arch. exp. Path. Pharm., 1936, 184, 101—108).—Irradiation of dead or live pig's skin led to increase of SH groups and of reducing power. P. W. C.

**Liberation of biologically active substances from the cut surface of nerve during physiological or artificial stimulation. I. Action on leech-muscle preparations.** G. BERGAMI, G. CANTONI, and T. GUALTIEROTTI (Arch. Ist. Biochim. Ital., 1936, 8, 267—298).—The properties of Ringer's or eserine-Ringer's solution in which is immersed the freshly cut end of a nerve (*in situ*) stimulated physiologically indicate the presence of a substance (I) resembling acetylcholine (II) and a principle antagonistic to (II), whilst with artificial stimulation there also occurs a factor which sensitises leech-muscle preps. towards (II). (I) is differentiated from (II) by (II) being unaffected by glucose whilst (I) is inactivated. F. O. H.

**Oxygen consumption of developing silkworm eggs during artificial hatching.** J. FUKUDA (Proc. Imp. Acad. Tokyo, 1936, 12, 269—271).—The  $O_2$  consumption of the eggs treated in five different ways (four involving use of HCl) prior to incubation are examined at various periods during incubation and the results are discussed: HCl treatment increases the  $O_2$  consumption in the developing eggs. J. W. B.

**Pharmacological action of deuterium oxide. I. Toxicity and symptoms. Metabolic rate. Water exchanges.** H. G. BARBOUR and J. TRACE (J. Pharm. Exp. Ther., 1936, 58, 460—482).—1 c.c. per 10 g. per day of 99.5%  $D_2O$  causes death of white mice in 7 days, when the body is 40—50% saturated and  $H_2O$  retention, due to a decreased flow of urine, occurs. After 4 days the body-temp. and metabolic rate diminish. The high  $\eta$  of  $D_2O$  appears to impede glomerular filtration and is a factor in  $D_2O$  poisoning. H. G. R.

**Influence of small dosages of copper on blood formation.** J. SOMOGYI (Magyar orvosi Arch., 1935, 36, 317—326; Chem. Zentr., 1936, i, 1649).—Injection of  $CuSO_4$  (in isotonic NaCl), in amounts < 1.66 mg. per kg. body-wt., increased the erythrocyte count and hæmoglobin content of rabbit's blood. Larger proportions had an inhibitory action. Beneficial effects of Cu in anemia etc. were not increased by simultaneous administration of Fe. A. G. P.

**Distribution in the organs and elimination of copper following intracardiac injection of copper glycine in guinea-pigs.** E. LASAUSSE, L. FROGRAIN, and C. POLLÉS (J. Pharm. Chim., 1936, [viii], 24, 489—499).—The distribution of Cu in the organs of

normal and pregnant guinea-pigs following injection of Cu glycine (equiv. to 0.5—4.6 mg. of Cu) is tabulated. The faecal elimination of Cu was > that in the urine. Modifications of the method (A., 1936, 536) of determining Cu when Mg and Mn are present are described. F. O. H.

**Comparison of therapeutic calcium salts. I. Minimum lethal dose by intravenous route of calcium chloride, lactate, gluconate, and pyruvate.** U. BALDACCI (Arch. Farm. sperim., 1936, 62, 91—107).—The min. lethal doses in rabbits are 0.0080, 0.0070, 0.0130, and 0.0180 g.-equiv. per kg., respectively. F. O. H.

**Duodenal activity.** W. J. R. CAMP (J. Pharm. Exp. Ther., 1936, 58, 393—401).—Excess of K in the duodenal cell results in contraction; when removed from the cell by a reduction process and a corresponding excess produced at the cell surface, a relaxation occurs.  $KMnO_4$  and  $NaMnO_4$  on intravenous injection inhibit adrenaline action, due to their oxidising properties in alkaline solution which may be neutralised by the use of reducing agents. H. G. R.

**Action of strontium chloride on the renal excretion of water and sodium chloride.** F. FRAU (Arch. Farm. sperim., 1936, 62, 77—90).—Intravenous injection of small doses (< 0.001 g.-equiv. per kg.) of  $SrCl_2$  into rabbits increases, whilst that of large doses diminishes, the excretion of  $H_2O$  and NaCl due to injection of hypertonic aq. NaCl. F. O. H.

**Effect of magnesia dust on the organism of the worker.** A. PLESCHTIZER (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 8—22).—Exposure of man to MgO dust increases Mg, Ca, and the Mg/Ca ratio in the blood-serum and decreases hæmoglobin. M. A. B.

**Liver-glycogen after [administration of] ammonium lactate.** R. GRANT (Trans. Roy. Soc. Canada, 1936, [iii], 30, V, 73—85).—Glycogen (I) was deposited in the livers of splenectomised rats when  $NH_4$  lactate (II) was given orally after a 24 hr. fast, but not when (II) was perfused directly into the portal circulation under otherwise identical conditions. With splenectomised cats, deposition of (I) following intraportal administration of (II) was more evident in livers with a moderately high fatty acid content than in those with normal or very high vals. J. N. A.

**Fixation of sulphonal by endocrine glands.** M. T. RÉGNIER (Compt. rend. Soc. Biol., 1936, 123, 1041—1042).—Sulphonal is fixed to a considerable extent by the adrenal and pituitary glands. H. G. R.

**Action of organic liquids on the skin.** (A) H. OETTEL. (B) W. HEUBNER and H. J. OETTEL (Arch. exp. Path. Pharm., 1936, 183, 641—696; 184, 77—80).—The effect of applying various substances to the intact human skin is investigated. The saturated hydrocarbons are more active than the unsaturated, aldehydes and anhydrides have only slight, and alcohols, ketones, and esters no, activity. The more quickly a substance is removed by the blood, the less is its activity. P. W. C.

**Diffusion of halogenated hydrocarbons through the skin.** P. SCHWANDER (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 109—116).— $C_2H_4Cl_2$ ,  $C_2H_5Cl_3$ ,  $C_2H_5Cl_4$ ,  $C_2HCl_5$ ,  $C_2Cl_6$ ,  $C_2HCl_3$ ,  $C_2Cl_4$ , EtBr, EtI, and  $CHBr_3$ , but not  $PbMe_4$  or vinyl esters, penetrated the skin of rabbits and were detected in the expired air.  $C_2H_5Cl_3$ ,  $C_2H_5Cl_4$ , and  $C_2Cl_6$  caused death. Compounds with b.p.  $< 80^\circ$  had no narcotic effect; the action of others increased generally with the b.p.

M. A. B.

**Diethylaminomethylbenzodioxan (883 F.): physiological examination of the optical isomerides.** D. BOVER and A. SIMON (Bull. Sci. Pharmacol., 1935, 42, 466—473; Chem. Zentr., 1936, i, 1656).—The *l*-isomeride is the more active.

A. G. P.

**Cell metabolism and cell division. I. Relation between structures, properties, and biological activities of nitrophenols.** G. H. A. CLOWES and M. KRAHL. **II. Stimulation of cellular oxidation and reversible inhibition of cell-division by di- and tri-halogenophenols.** M. E. KRAHL and G. H. A. CLOWES (J. Gen. Physiol., 1936, 20, 145—171, 173—184; cf. A., 1936, 1414).—(I) The respiration of fertilised eggs of *Arbacia punctulata* is stimulated by small concns. of various nitrophenols (I), the optimum for 4:6-dinitro-*o*-cresol being  $4 \times 10^{-6}M$ , when the  $O_2$  consumption is increased about 300%. Higher concns. of (I) diminish respiration, often to  $<$  normal. At or about the optimum concn., cell division is blocked; this action is fully reversible over a wide range of concn. Reduction products of (I) show much lower activities. Stimulation of respiration and the block to cell division are possibly due to separate factors. There is an optimum stage in the mitotic cycle for the blocking effect. The effects are probably not due to the (I) acting as oxidation-reduction systems.

**II. Di- and tri-halogeno- and mixed nitrohalogenophenols produce similar effects to those of the (I), but are rather less active.** Monohalogenophenols, unlike *p*-nitrophenol, are inactive, but, *s*-trihalogenophenols, unlike *s*-trinitrophenols, are active (further evidence against an oxidation-reduction mechanism). These halogenophenols do not significantly increase the body-temp. or respiration rate of rats or dogs.

F. A. A.

**Stimulation of oxygen consumption and suppression of cell division by di- and tri-halogenated phenols.** M. E. KRAHL and G. H. A. CLOWES (Proc. Soc. Exp. Biol. Med., 1935, 33, 477—478; A., 1935, 1533).—In fertilised eggs of *Arbacia punctulata*  $O_2$  consumption is stimulated and cell division is reversibly suppressed by 2:4-di- and 2:4:5- and 2:4:6-tri- but not by 2:6-di-halogenated phenols. The metabolic rate in rats and the body-temp of pigeons and dogs are not increased by intravenous injection of 2:4- $C_6H_3Cl_2$ -OH.

W. McC.

**Antagonism between acetylcholine and amyl nitrite in the action on the heart.** H. FREDERICQ (Arch. int. Physiol., 1935, 41, 569—570; Chem. Zentr., 1936, i, 1455).—No antagonism occurs.

A. G. P.

**Role of the adrenaline-secretory activity of acetylcholine in its action on the blood-sugar.**

F. JOURDAN and P. GALT (Compt. rend. Soc. Biol., 1936, 123, 902—904).—The secretion of adrenaline on intravenous injection masks the hypoglycemia observed on intramuscular injection.

H. G. R.

**Physiologically active substance in the body resulting from the administration of acetyl- $\beta$ -methylcholine chloride by iontophoresis.** W. F. ALEXANDER and A. J. KOTKIS (J. Pharm. Exp. Ther., 1936, 58, 439—453).—A substance similar to acetyl- $\beta$ -methylcholine chloride (I) can be obtained (1 part in  $1 \times 10^6$ ) in the perfusate from the limb after iontophoresis with (I) but is not observed after a corresponding treatment with aq. NaCl.

H. G. R.

**Blood-amylase response to acetyl- $\beta$ -methylcholine chloride in pancreatectomised dogs.** L. TUCHMAN, A. SCHIFFRIN, and W. ANTROPOL (Proc. Soc. Exp. Biol. Med., 1936, 33, 142—144).—The blood-amylase response to the drug is not elicited after pancreatectomy.

P. G. M.

**Absorption of bile acids from the intestines.** B. JOSEPHSON and A. RYDIN (Biochem. J., 1936, 30, 2224—2228).—Aq. Na cholate or glycocholate, injected into the small intestines of rabbits and cats after laparotomy, increases the bile acid content of the heart blood and, to a greater extent, that of the portal blood, indicating absorption by the portal vein. Absorption by the lymph vessels does not occur, since animals jaundiced by ligation of the bile duct show less bile acid in the systemic than in the portal blood; moreover, the lymph of horses contains no cholic acid, even after injection of bile salts into the intestine.

F. A. A.

**Liver preparation protecting against necrosis from chloroform or carbon tetrachloride administration.** J. C. FORBES, R. C. NEALE, and J. H. SCHERER (J. Pharm. Exp. Ther., 1936, 58, 402—408).—The prep. of material active by injection is described. The active principle is not choline, glucose, or the pernicious anaemia factor.

H. G. R.

**Pyramidone, luminal, and similar substances in investigations of agranulocytosis.** Y. SCHILLING (Med. Welt, 1935, 9, 1808—1809; Chem. Zentr., 1936, i, 1657).—The mechanism of the action of these and other drugs on leucocytes is examined.

A. G. P.

**Acute narcotic action of aliphatic and aromatic hydrocarbons. I. Effect of single inspirations of various concentrations of benzene, benzene, toluene, and xylene on rabbits and cats.** W. E. ENGELHARDT and W. ESTLER. **II. Effects of repeated inspirations on white mice.** W. ESTLER (Arch. Hyg. Bakt., 1935, 114, 249—260, 261—271; Chem. Zentr., 1936, i, 1258).—I. In low concns.  $C_6H_6$  was less toxic than its homologues, and in high concns. its toxicity was  $>$  that of PhMe. Rabbits, in contrast to cats, were more sensitive to PhMe than to xylene (I). Benzene (II) had much smaller effects.

**II. Toxicity increased in the order (II),  $C_6H_6$ , PhMe, (I).**

A. G. P.

**Experimental porphyrinuria induced by narcotics.** W. LAUBENDER (Arch. exp. Path. Pharm.,

1936, 184, 95).—Small amounts of sulphonal injected into rabbits cause excretion of a pigment which although a porphyrin precursor is not either copro- or uro-porphyrin. The pigment is present in normal urine in small amount but is not increased by injecting other narcotics such as veronal, noctal, and phanodorm. P. W. C.

Effect of terminal procedures on liver-glycogen. W. F. REINDOLLAR (Proc. Soc. Exp. Biol. Med., 1936, 33, 182—183).—Evipal, its Me derivative, or phanodorm does not depress the liver-glycogen of the rat as compared with decapitation. P. G. M.

[Pharmacology of] cyclopropane. I. Determination in air, water, and blood by means of iodine pentoxide. II. Concentrations required in air and blood for anaesthesia, loss of reflexes, and respiratory arrest [in dogs]. B. H. ROBBINS (J. Pharm. Exp. Ther., 1936, 58, 243—250, 251—259).—I. The  $I_2O_5$  method is adapted for the determination of cyclopropane (I) in air,  $H_2O$ , and blood. The distribution ratio of (I) between  $H_2O$  and air, and blood and air, is determined.

II. Data are given. The average distribution ratio of (I) between blood and air *in vivo* is 0.492.

E. M. W.

Propylene impurities. Hexenes and hexanes. V. E. HENDERSON and A. H. R. SMITH (J. Pharm. Exp. Ther., 1936, 58, 319—327).—Hexenes produce an unusual type of anaesthesia with concns. approx. equal to those required by the corresponding hexanes.

E. M. W.

Effects of anaesthesia on the autoxidation of surviving brain tissue. G. A. EMERSON (Proc. Soc. Exp. Biol. Med., 1936, 33, 171—177).—Glycogenolytic anaesthetics ( $Et_2O$  etc.) and adrenaline decrease the rate of autoxidation of rat brain tissue. Amytal inhibits this effect. The action of other narcotics cannot be correlated with autoxidation. P. G. M.

Synthesis of local anaesthetics from cytosine.—See A., II, 80.

Pharmacological modification of bodily performance in sport. M. BAUR (Arch. exp. Path. Pharm., 1936, 184, 51—66).—A lecture. P. W. C.

Changed action of medicinal substances in hypertonic solution. W. HAARMANN (Arch. exp. Path. Pharm., 1936, 184, 95—97).—Whereas injection into a rabbit of 9 mg. of cocaine per kg. led to convulsions lasting 3 min., the same injection in hypertonic  $Na_2SO_4$  into the same rabbit led to convulsions lasting 19 min. No convulsions were obtained on replacing  $Na_2SO_4$  with glucose or NaCl. 1.3 mg. per kg. of picrotoxin led to convulsions lasting 37 min., but in hypertonic NaCl only 2 min., whereas in NaOAc or  $Na_2SO_4$  it caused death. With 20 mg. per kg. of cardiazole, convulsions lasted 10—15 min., but were entirely absent when injected in hypertonic solution. The animals withstood double the lethal dose of morphine when injected in hypertonic NaCl or glucose solution but tolerated less than the lethal dose in NaOAc +  $Ca(OAc)_2$ . Similar results were obtained with medinal or bromoural.

P. W. C.

Effect of normal and caffeine-free coffee on oxygen consumption, pulse rate, and blood pressure [of men]. K. HORST, R. J. WILLSON, and R. G. SMITH (J. Pharm. Exp. Ther., 1936, 58, 294—304).—Coffee increases  $O_2$  consumption, and slightly increases blood pressure and pulse rate. Caffeine-free coffee has negligible but irregular effects.

E. M. W.

Pharmacodynamics of coffee constituents. H. SEEL (Med. Welt, 1935, 9, 1422—1424; Chem. Zentr., 1936, i, 1454).—Treatment of chlorogenic acid (I) by Lendrich's method does not lead to fission into quinic and caffeic acids, although a change is produced in (I) and can be detected physicochemically and pharmacologically. The "changed" acid has less physiological activity.

A. G. P.

Actions of diuretic drugs and changes in metabolites in oedematous patients. A. B. STOCKTON (Arch. Int. Med., 1936, 58, 891—900).—The increase in blood-Cl preceding diuresis and the concurrent increase in blood- and urine-Cl indicate that both metallic (merbaphen, salyrgan, Na Bi tartrate) and xanthine (theophylline) diuretic drugs act directly on the tissues in general and not only on the kidneys; the latter mechanism applies to digitalis diuresis which is characterised by increased urinary excretion of Cl and simultaneous decreases in urine- and blood-Cl levels.

F. O. H.

Action of extracts of shepherd's purse [on animals]. L. BUTTURINI and P. MARANGONI (Boll. Soc. ital. Biol. sperim., 1934, 9, 240—243; Chem. Zentr., 1936, i, 1258).—The extracts, injected intravenously into rabbits, lowered blood pressure but caused no reversal of the action of adrenaline. There was no influence on pregnancy.

A. G. P.

Natural coumarins and their action on fish.—See A., II, 29.

Pharmacological action of conessine and isoconessine.—See A., II, 39.

Absorption of *g*-strophanthin by the liver. M. KIESE (Arch. exp. Path. Pharm., 1936, 184, 99—100).—The amount of strophanthin (I) absorbed was calc. from the difference of the lethal doses for the heart-lung and the heart-lung-liver preps. of dogs. When (I) was infused into the vena cava sup. the absorption was 1.53 and into the portal vein in 10 times the concn. was  $3.09 \times 10^{-6}$  g. per g. of liver.

P. W. C.

Synthetic derivatives of *k*-strophanthidin. W. NEUMANN (Arch. exp. Path. Pharm., 1936, 184, 100—101).—The pharmacological activity of 30 esters of strophanthidin with org. acids is compared with that of the natural glucoside. Some of the esters exceeded the aglucone in activity on the isolated frog's heart and in rabbits but they were less active in cats.

P. W. C.

Assay of atropine by the isolated frog's heart. W. SCHMID (Arch. exp. Path. Pharm., 1936, 184, 68).—By pretreatment with atropine (I) and subsequent administration of acetylcholine; reproducible results are obtained for  $10^{-7}$  g. of (I) with an accuracy of  $\pm 10$ —15%.

P. W. C.

**Chronic morphine poisoning in dogs. VI. Effect of increasing tissue oxidations by dinitrophenol on the excretion of morphine in tolerant and non-tolerant dogs.** O. H. PLANT and D. SLAUGHTER (J. Pharm. Exp. Ther., 1936, 58, 417—427).—The excretion of morphine is markedly decreased in non-tolerant, but unaffected in tolerant, dogs. H. G. R.

**Fate of hydroxydimorphine following intravenous injection.** B. DREVON and A. RICHARD (Compt. rend. Soc. Biol., 1936, 123, 964—967).—The alkaloid rapidly disappears from the blood (of dogs) and is found principally in the vascular tissues. H. G. R.

**Colour reactions for cardiac glucosides.**—See A., II, 52.

**Anthelmintics. I. Anthelmintic action of alantolactone.** S. OZEKI, M. KOTAKE, and K. HAYASI (Proc. Imp. Acad. Tokyo, 1936, 12, 233—234).—When freed from higher terpenoid substances alantolactone, from the root of *Inula helenium*, L., has only a slightly bitter taste and no emetic action. It is less toxic and has greater anthelmintic properties than has santonin (0.1% is effective in 16 hr. and 2 days, respectively). J. W. B.

**Fatal poisoning by sodium nitrite.** T. A. C. MCQUISTON (Lancet, 1936, 231, 1153—1154).—Three fatal cases resulting from food eaten with  $\text{NaNO}_2$  instead of  $\text{NaCl}$  are recorded. L. S. T.

**Distribution of inhaled mercury.** W. WIRTH (Arch. exp. Path. Pharm., 1936, 184, 91—92).—Dogs after breathing air containing  $60\text{--}145 \times 10^{-6}$  g. of Hg per cu.m. for 2.5—8.5 hr. were killed and the Hg contents of the organs determined. The lung-Hg was initially increased by 30—40, the kidney by 5—10, and brain by 6 times. After stopping inhalation, the lung concn. decreased quickly and was about 3 times normal after 3 weeks. In the same time kidney and liver concns. were not decreased. P. W. C.

**Minimum fatal doses of selenium, tellurium, arsenic, and vanadium.** K. W. FRANKE and A. L. MOXON (J. Pharm. Exp. Ther., 1936, 58, 454—459).—The min. fatal doses in mg. per kg. for rats by intraperitoneal injection were: Se 3.25—3.50 as  $\text{Na}_2\text{SeO}_3$ , 5.25—5.75 as  $\text{Na}_2\text{SeO}_4$ ; Te 2.25—2.50 as  $\text{Na}_2\text{TeO}_3$ , 20—30 as  $\text{Na}_2\text{TeO}_4$ ; As 4.25—4.75 as  $\text{Na}_2\text{HAsO}_3$ , 14—18 as  $\text{Na}_2\text{HAsO}_4$ ; V 4—5 as  $\text{NaVO}_3$ ; Mo > 160 as  $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}$ . H. G. R.

**Toxicity of food containing selenium: effect on rats.** H. E. MUNSELL, G. M. DE VANEY, and M. H. KENNEDY (U.S. Dept. Agric. Tech. Bull., 1936, No. 534, 25 pp.).—The threshold lethal dose of Se for rats was 13—18 p.p.m. in the diet. Wheat containing smaller proportions of Se adversely affected growth and reproduction. Storage of Se in the body is not cumulative. Se injury persisted after the toxic diet had been discontinued and nearly all Se had been eliminated. A. G. P.

**Toxicity of rhodium.** O. H. PLANT (J. Pharm. Exp. Ther., 1936, 58, 428—430).—The toxicity of  $\text{RhCl}_3$  is low in rats, rabbits, dogs. H. G. R.

**Action of tobacco enzyme on rutin and other phenols.** C. NEUBERG and H. KOBEL (Enzymologia, 1936, 1, 177—182).—Enzyme preps give the typical brown colour of fermented tobacco. E. D. Y.

**Colorimetric determination of carbonic anhydrase.** F. J. PHILPOT and J. ST. L. PHILPOT (Biochem. J., 1936, 30, 2191—2193).—A modification of the method of Brinkman (J. Physiol., 1933, 80, 171) is described. F. A. A.

**Chemical and biochemical dehydrogenation of  $\alpha\alpha'$ -dideuterosuccinic acid.**—See A., II, 48.

**Nicotine inhibition of oxidation and fermentation.** G. F. GAUSE (Nature, 1936, 138, 976).—Hydronicotine and not *d*-nicotine is responsible for the inhibition of oxidations previously reported (A., 1936, 1416). L. S. T.

**Apricot seeds as a source of dehydrogenases.** C. GURCHOT (Proc. Soc. Exp. Biol. Med., 1935, 33, 285—287).—Of various plant materials tested, the apricot seed skins were the richest in dehydrogenase. W. O. K.

**Dehydrogenase systems.** H. VON EULER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 15, 6 pp.).—A preliminary study of the role of co-enzymes and inhibitors on dehydrogenations in heart and skeletal muscle. E. A. H. R.

**Mechanism of enzyme action. XIV. Dehydrogenation by *Fusarium lini*.** Bolley. O. T. ROTINI, E. DAMMANN, and F. F. NORD (Biochem. Z., 1936, 288, 414—420; cf. A., 1936, 896).—The dehydrogenation of alcohols by *F. lini* results in the production of AcOH and succinic acid, the final product being either lactic (by decarboxylation) or tartaric acid. Thus *F. lini* contains a zymase, phosphatase, and dehydrogenase. F. O. H.

**Enzymic degradation of polyvinyl alcohol.** E. DAMMANN, F. E. M. LANGE, M. A. BREDIG, and F. F. NORD (Biochem. Z., 1936, 288, 421—428).—The action of *F. lini* on the alcohol (cf. preceding abstract), during which  $\text{CO}_2$  is liberated, is not accompanied by changes in  $\eta$ , rate of diffusion, or X-ray pattern; hence no fission in the mol. chain occurs. F. O. H.

**Lactucarium. I.** G. SCHLENK and H. GRAF (Arch. Pharm., 1936, 274, 537—542).—Lactucin has no pharmacological action; it may be a degradation product of the juice. The fresh or dried juice of *Lactuca virosa* oxidises in air. It contains an oxidase, inactivation of which at  $80^\circ$  stabilises the juice. If the juice is kept in a closed vessel, an aq. layer separates; this, when dried by atomisation at 2 mm., gives a pale yellow,  $\text{H}_2\text{O}$ -sol., stable powder, which contains all the activity of the fresh juice. R. S. C.

**Aldehyde-reductase in milk and the influence thereon of copper and of bacterial activity.** W. RITTER (Landw. Jahrb. Schweiz, 1935, 49, 873—886; Chem. Zentr., 1936, i, 1740).—Small quantities of Cu inhibit the enzyme, especially in long-period pasteuration. Certain organisms restrict this action of Cu.  $\text{H}_2\text{O}_2$  injures the enzyme: metol and quinol do not diminish the time of decolorisation. A. G. P.

**Chemistry of catalase.** H. TAUBER and I. S. KLEINER (Proc. Soc. Exp. Biol. Med., 1935, **33**, 391—392).—Liver-catalase (I) (ox, rabbit, rat) is not split into two inactive components by dialysis against 0.1*N*- or 0.01*N*-HCl but is inactivated by digestion with trypsin. Digested (I) mixed with (I) inactivated by H<sub>2</sub>S or KCN is not re-activated on incubation. No re-activation occurs on adding human plasma, ovalbumin, or milk to digested (I). W. McC.

**Activation by heat of the catalase of fat.** J. BODNAR and J. BARTFAI (BAUBACH) (Z. physiol. Chem., 1936, **244**, 225—228).—The activity of the catalase of fresh pig's fat (taken in winter) is increased 62—112% by heating, the optimal duration of heating and temp. being respectively 2 hr. and 42°. With fat taken in summer, the optimal temp. is 31° and the increase in activity is 28%, whilst with cell-free aq. extract of the fat, the vals. are 45° and 31%, respectively. W. McC.

**Cellulase from the slug, *Limax flavus*, Linnæus.** W. W. TRIBBY and E. B. CARMICHAEL (Proc. Soc. Exp. Biol. Med., 1936, **33**, 42—44).—The optimum *p*<sub>H</sub> for this enzyme was 5.0 in OAc' buffers. It was present in aq. or saline extracts of the liver and in the gastrointestinal contents but not in the stomach or intestinal walls. P. G. M.

**Composition of dried meat of the sea-ear; glycogenase of the fresh sea-ear (*Haliotis gigantea*, Gm.).** K. KONDO and S. SHINANO (J. Agric. Chem. Soc. Japan, 1936, **12**, 1221—1226).—Dried sea-ear contains H<sub>2</sub>O 35—38, glycogen 10%, and protein. Glycogenase occurs in fresh sea-ear. E. M. W.

***Acer saccharum*. Amylases of maple sap and their buffering power.** E. BOIS and A. NADEAU (Canad. J. Res., 1936, **14**, B, 373—380).—The dialysed extract of enzymes from maple sap, acidified with 0.01*N*-HCl has been submitted to electrometric titration with 0.01*N*-NaOH using a differential Sb electrode. The curve connecting *p*<sub>H</sub> and the "buffering power"  $t - \Delta m / \Delta p_H$  ( $\Delta m$  = g.-equiv. of reactant added per litre) (cf. Koppel *et al.*, A., 1914, i, 1105) has minima at *p*<sub>H</sub> 4.6—4.9 and 6.5—6.7, thus confirming the earlier conclusion (A., 1935, 658) regarding the presence of two amylases, termed sucro- and cellobio-genic, respectively. J. W. B.

**Koji-amylase.** Y. TOKUOKA (J. Agric. Chem. Soc. Japan, 1936, **12**, 1185—1202).—The extraction of amylase (I) from koji is greatly increased by the presence of neutral salts in the H<sub>2</sub>O. Extraction with H<sub>2</sub>O removes maltase (II). Subsequent extraction with NaCl yielded (II)-free (I). In sake-mash fermentation (I) is adsorbed on steamed rice. E. M. W.

**Effect of hormones and bios extracts on amylase activity.** H. J. BREMNER and R. H. CLARK (Trans. Roy. Soc. Canada, 1936, [iii], **30**, III, 145—148).—Insulin, parathyroid and pituitary extracts, and acetylcholine have no effect on the hydrolysis of starch by malt diastase at *p*<sub>H</sub> 5.0. Adrenaline (0.001—0.01 mg. per c.c.) causes inhibition, but has no effect in physiological concns. Bios I, IIA and IIB together, or I + IIA stimulate diastatic activity, which

increases with increasing concn. IIB or IIB + IIA have little effect, but IIB potentiates the activity of I + IIA. J. L. D.

**Rates of digestion of starches and glycogen and the bearing on chemical constitution. II. Liver-amylase.** G. E. GLOCK (Biochem. J., 1936, **30**, 2313—2318).—COMe<sub>2</sub>-extracted and dried liver preps. of rat, cat, rabbit, and pig in PO<sub>4</sub>''' buffer at *p*<sub>H</sub> 6.4 always had maltase activity. Rat and ox sera were also active but cat and rabbit sera were inactive. In the case of pig liver only was there quant. conversion into glucose (I), the reaction being inhibited by glycerol. Maltose (II) was the sole end product with cat, rabbit, and perfused rat liver preps. Unperfused rat liver produced (II) in the early stages but this was gradually converted into (I) as digestion proceeded. The reducing power of rat (perfused and unperfused) and cat liver preps. showed a steady decrease from 17 to 42 hr. due to reversal of enzymic activity. P. W. C.

**Enzymic reactions in heavy water. II. Deuterium and the hydrolysis of starch.** D. L. FOX and R. CRAIG (Proc. Soc. Exp. Biol. Med., 1935, **33**, 266—269).—Starch, the labile H of which has been exchanged for D by heating with D<sub>2</sub>O, is more rapidly hydrolysed by amylase from the muscle of *Mytilus californianus* than is ordinary starch. W. O. K.

**Decomposition of *d*-fructose-6-phosphoric acid to *d*-arabonic acid-5-phosphoric acid and the enzymic scission of the latter.**—See A., II, 52.

**Hydrolysis and synthesis of cholesteryl esters in the animal organism.** P. E. SIMOLA and T. KALAJA (Suomen Kem., 1936, **9**, B, 27—28).—Pulped, or aq. extracts of, blood, plasma, serum, liver, spleen, brain, and adrenal of horse, cow, sheep, and swine were incubated for 1—3 days at 37° in presence of PhMe. With sera synthesis of cholesteryl esters (I) sometimes occurred and in no case was hydrolysis observed. Hydrolysis of (I) was observed with liver of horse, cow, and swine, and spleen and brain of cow. Adrenal showed no hydrolysis and synthesis in some cases. The factors determining the reactions are discussed. R. S. B.

**Esterase activity of human blood-plasma.** B. VAHLQUIST (Skand. Arch. Physiol., 1935, **72**, 133—160; Chem. Zentr., 1936, i, 1641).—Hydrolysis of acetylcholine by plasma is effected by the same enzyme which hydrolyses tributyrin. The esterase is not concerned in the regulation of vegetative processes of the body. A. G. P.

**Asymmetric hydrolysis of esters by enzymes. XI. Simultaneous action of human pancreas-lipase and liver-esterase on a racemic ester.** E. BAMANN, C. FEICHTNER, and W. SALZER. XII. Stereochemical specificity of human pancreas-lipase. E. BAMANN and C. FEICHTNER (Biochem. Z., 1936, **288**, 310—314, 315—316).—XI. The sp. hydrolysis of *dl*-Et mandelate (I) by liver-esterase is partly inhibited by the presence of active pancreas-lipase. The concomitant inhibitory influence of liberated EtOH and change in substrate composition are discussed.

XII. The optical specificity of the lipase in hydrolysing (I) is independent of the initial concn. of substrate (cf. Ammon and Tabor, A., 1934, 218).

F. O. H.

**Inhibition of the hydrolysis of butyrylcholine perchlorate by serum in presence of geneserine.** E. J. BOZONNET (Compt. rend. Soc. Biol., 1936, 123, 920—922).—Geneserine inhibits the action of serum-esterase since the hydrolysis of both acetyl- and butyryl-choline is inhibited.

H. G. R.

**Specificity of aspartase.** A. I. VIRTANEN and T. LAINE (Suomen Kem., 1936, 9, B, 28).—The  $\text{NH}_3$  obtained by the action of aspartase on *dl*-aspartic acid corresponded with the amount of *l*-acid present, in confirmation of previous work.

R. S. B.

**Specificity of aspartase.** K. P. JACOBSON and M. SOARES (Enzymologia, 1936, 1, 183—190).—Crotonic acid and Et fumarate are unaffected by aspartase of "resting" *B. coli*. The enzyme effects addition of  $\text{NH}_3$ ,  $\text{NH}_2\text{OH}$ , and  $\text{N}_2\text{H}_4$  at the double linking of fumaric acid. With  $\text{NH}_2\text{OH}$  amino-hydroxysuccinic acid is formed.

E. D. Y.

**Stereochemical specificity of aspartase.** K. P. JACOBSON and F. B. PEREIRA (Compt. rend. Soc. Biol., 1936, 123, 611—613).—Equiv. amounts of  $\text{NH}_4^+$  are formed by the action of aspartase on *l*-aspartate and on a solution of the racemate containing an equiv. amount of the *l*-isomeride.

H. G. R.

**Metal ion activation in enzymic catalysis. Arginase.**—See A., I, 89.

**Urease activity of germinated seeds.** A. VENKATASUBBAN, R. KARNAD, and N. N. DASTUR (Proc. Indian Acad. Sci., 1936, 4, B, 370—375).—Urease activity in extracts of germinated seeds is  $>$  in those of resting seeds. In powdered seeds resting forms yielded the more active product. Germination effects the solubilisation of the desmo-enzyme present in resting seeds.

A. G. P.

**[Failure of] enzymes to hydrolyse diketopiperazine carboxylic acids.** E. WALDSCHMIDT-LEITZ and M. GARTNER (Z. physiol. Chem., 1936, 244, 221—224).—2 : 5-Diketopiperazine-3 : 6-diacetic acid and 2 : 5-diketopiperazinepropionic acid were not hydrolysed by various proteinase and peptidase preps.

W. McC.

**Comparison of antitryptic activity of egg-white with its capacity to produce a characteristic nutritional disorder.** H. T. PARSONS [with E. KELLY] (J. Biol. Chem., 1936, 116, 685—690).—The pellagra-like syndrome due to egg-white is not attributable to its content of antitrypsin.

J. N. A.

**Activation of partially purified pepsinogen.** H. HOLTER and J. H. NORTHROP (Proc. Soc. Exp. Biol. Med., 1936, 33, 72—75).—During activation at  $p_{\text{H}}$  4 there is a parallel increase of N not pptd. by  $\text{CCl}_3\text{CO}_2\text{H}$  at  $80^\circ$ . Pepsinogen cannot be activated by trypsin or papain.

P. G. M.

**Magnesium-activated leucyl peptidase of animal erepsin.** M. J. JOHNSON, G. H. JOHNSON, and W. H. PETERSON (J. Biol. Chem., 1936, 116, 515—526).—Pig erepsin contains, besides an aminopoly-peptidase (Waldschmidt-Leitz), a leucyl peptidase

(I), which can be separated by pptn. with  $\text{COMe}_3$  and then with EtOH. (I) hydrolyses leucyl- and alanyl-diglycine and glycyl-leucylglycine, but not tri- or tetra-glycine. Its activity depends on the presence of  $\text{Mg}^{++}$ ; it thus differs from the aminopoly-peptidase of *Aspergillus parasiticus*. Erepsin contains a further dipeptidase.

F. A. A.

**Proteolytic activity of pancreatic juice, trypsin, and erepsin.** C. LAURESCO (Arch. int. Physiol., 1935, 42, 169—182; Chem. Zentr., 1936, i, 1643).—Fission of protein by active juice occurs to the following extents: ovalbumin 75, casein and edestin 55, gelatin 50, gliadin 45%. The resistance of the last two named is associated with their proline and glutamine contents.

A. G. P.

**Specificity of proteinases.** S. AKABORI and S. TAKASE (Proc. Imp. Acad. Tokyo, 1936, 12, 242—244).—Neither diketopiperazine-acetic, m.p. 217—218°,  $[\alpha]_D^{20}$  0° (lit. m.p. 270°) [Et ester, m.p. 207—207.5° (lit. m.p. 211°)], nor -propionic acid, m.p. 222—223° (lit. m.p. 225°),  $[\alpha]_D^{25}$  +15.09° [Et ester, m.p. 176—178° (lit. m.p. 140°)], undergoes fission with pure trypsin or trypsin-kinase at  $p_{\text{H}}$  7.7, or with papain at  $p_{\text{H}}$  5 (cf. Ishiyama, A., 1933, 723).

J. W. B.

**Secretion of bacterial proteases and their dependence on  $p_{\text{H}}$ .** G. GORBACH and E. PIRCH (Enzymologia, 1936, 1, 191—198).—Young cultures of *B. fluorescens* and *B. pyocyaneus* produce in the culture medium (preferably peptone) a bacterium autolysing proteinase (I) (optimum  $p_{\text{H}}$  7.0). A peptidase (optimum  $p_{\text{H}}$  8.4) remains in the cells. The mol. size of (I) from *B. fluorescens* is  $<$  that of the peptidase.

E. D. Y.

**Enzyme action. I. Determination of pepsin and trypsin in yeast.** M. HECHT and H. CIVIN (J. Biol. Chem., 1936, 116, 477—488).—Yeast contains a pepsin acting at  $p_{\text{H}}$  1.8, best obtained by lysis by  $\text{Et}_2\text{O}$ . The enzyme is unstable, being inactivated on dilution.

F. A. A.

**Absorption spectra of dihydropyridine compounds.** E. HAAS (Biochem. Z., 1936, 288, 123—125).—Acidification of dihydro-nicotinamide methiodide and -di- and -tri-phosphopyridine nucleotide is accompanied by formation of an absorption band at 300 m $\mu$  which is permanent if 0.002% of  $\text{NaHSO}_3$  is present. The bearing of this phenomenon on the co-enzyme action of  $\text{C}_5\text{H}_5\text{N}$  nucleotide is discussed.

F. O. H.

**Co-enzyme systems of carboxylase.** H. ALBERS and A. SCHNEIDER (Naturwiss., 1936, 24, 794).—Two substances can function as co-enzymes for dialysed yeast carboxylase; one, of unknown composition, is activated further by  $\text{PO}_4'''$  but not by  $\text{Mg}^{++}$ , and the other, adenylic acid (I), by both  $\text{PO}_4'''$  and  $\text{Mg}^{++}$ . The former is the more potent. (I) can be replaced by cozymase-(II) inactivated by alkali, but not by (II) itself. Both holo-enzymes are inhibited by the MeCHO produced, the inhibition being partly reversed in the presence of glucose.

E. A. H. R.

**Action of cozymase as the specific co-enzyme of lactic dehydrogenase from heart muscle.** E. ADLER, H. VON EULER, and H. HELLSTROM (Nature,

1936, 138, 968—969).—The co-enzyme of lactic dehydrogenase is identical with that of alcohol dehydrogenase and therefore with cozymase. Dihydrocozymase can act as the prosthetic group of lactic dehydrogenase in the reduction of  $\text{AcCO}_2\text{H}$  to lactic acid. L. S. T.

**Participation of adenylic acid and cozymase in phosphorylation.** H. VON EULER and E. ADLER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 12, 6 pp.).—The dependence of the rate of fermentation by apozymase on the amount of adenylic acid (I) added shows that (I) functions as a  $\text{PO}_4'''$  carrier between phosphopyruvic acid and glucose. Cozymase (II) and (II) inactivated by alkali are more active carriers than (I). This function of (II) is probably connected with a group similar to (I). By chromatographic purification of (II) preps. of moderate purity, a second co-enzyme is obtained, which may be identical with the Warburg co-enzyme from red blood cells. E. A. H. R.

**Enzymic mechanism of oxidation-reduction processes in fermentation and glycolysis.** H. VON EULER and E. ADLER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 16, 6 pp.).—A discussion of the suggested mechanism of alcoholic fermentation by the coupling of the triose phosphate and alcohol dehydrogenases with flavin enzyme (I) and cozymase (II).  $\text{CHO}\cdot\text{CH}(\text{OH})\cdot\text{CH}_2\cdot\text{O}\cdot\text{PO}(\text{OH})_2$  dehydrogenase is contained in the EtOH ppt. of yeast maceration juice. It requires the co-operation of (I) and (II) for its action. E. A. H. R.

**Pentosephosphoric acid from cozymase.** F. SCHLENK (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 17, 4 pp.).—Cozymase (I) gives pentosephosphoric acid (II) on acid hydrolysis. The yield of (II) proves that both carbohydrates in (I) are pentoses. The pentose is probably *d*-ribose. Measurements of the rate of hydrolysis of (II) indicate that it is a mixture of ribose-3- and -5-phosphoric acids. E. A. H. R.

**Nicotinamide from cozymase.** H. ALBERS, F. SCHLENK, and H. VON EULER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 21, 3 pp.).—The low N vals. recorded for the picrolonate of nicotinamide isolated from cozymase and the Warburg co-enzyme from red blood cells (cf. Warburg *et al.*, A., 1935, 121; Euler *et al.*, A., 1936, 245) are due to EtOH of crystallisation. E. A. H. R.

**Action of ultra-violet light on cozymase.** H. VON EULER and F. SCHLENK (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 19, 5 pp.).—Ultra-violet irradiation of cozymase (I) destroys its fermentation activating powers, but its activity as a  $\text{PO}_4'''$  carrier is retained. The rate of inactivation decreases with increasing (I) concn. The action of ultra-violet light is compared with that of alkali (cf. following abstract). E. A. H. R.

**Behaviour of cozymase to alkali.** F. SCHLENK and H. VON EULER (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 20, 5 pp.).—Hydrolysis of cozymase with dil. NaOH gives nicotinamide and a substance (I) containing (probably) 1 mol. of adenine, 2 mols. of pentose, and 2 of  $\text{H}_3\text{PO}_4$ . (I) retains its power as a  $\text{PO}_4'''$  carrier but not as a H carrier. E. A. H. R.

**Cozymase.** F. SCHLENK and H. VON EULER (Naturwiss., 1936, 24, 794—795).—A possible structure for cozymase based on its monobasicity and the results of alkaline hydrolysis is suggested.

E. A. H. R.

**Non-replaceability of cozymase in the enzymic formation of lactic acid.** O. MEYERHOF and P. OHLMEYER (Naturwiss., 1936, 24, 741—742).—The reaction, triosephosphoric acid +  $\text{AcCO}_2\text{H} \rightarrow$  phosphoglyceric acid + lactic acid (I) proceeds slowly in presence of muscle extract (containing F') dialysed for 15 hr., to which a small quantity of  $\text{Mg}^{++}$  has been added, and is markedly accelerated by addition of adenylic acid (II). When dialysis is continued for 36—48 hr. no (I) is formed either with or without the addition of (II). Alkali-inactivated cozymase (III) (cf. Euler and Gunther, A., 1935, 1278) is likewise ineffective, but (III) itself completely restores the rate of formation of (I). Much more (III) is required for max. activity in the absence than in the presence of (II). The disappearance of  $\text{AcCO}_2\text{H}$  runs parallel with the formation of (I). Probably (III) cannot be replaced by (II) in the oxido-reductive phase of (I) formation. This result is similar to that previously obtained for the yeast fermentation reactions. W. O. K.

**Physiological re-oxidation of reduced yellow enzyme.** H. THEORELL (Biochem. Z., 1936, 288, 317—328).—The kinetics of the reactions between mol.  $\text{O}_2$ , cytochrome-c (I), and the respiratory enzyme system of Warburg and Christian indicate that the reduced (dihydro-) co-enzyme reacts with the yellow enzyme (II) to give co-enzyme (III) and reduced (dihydro-) (II) which can be oxidised by  $\text{Fe}^{+++}$ ; oxidised (I) oxidises reduced (II) but not (III) (cf. A., 1935, 1277). The alternative mode of oxidation of reduced (II), i.e., by the  $\text{O}_2$  normally present in the cell, is shown to be negligible by the practically complete absence of formation of  $\text{H}_2\text{O}_2$ . The physiological role of (II) is discussed. F. O. H.

**Physico-chemical characteristics of the yellow respiratory enzyme.** R. A. KEKWICK and K. O. PEDERSEN (Biochem. J., 1936, 30, 2201—2205).—Sedimentation velocity and diffusion data indicate that the yellow enzyme (I) of Warburg and Christian has mol. wt. approx. 80,000. Agreement of this val. with that from determinations of flavin indicates that (I) has one flavin group per mol. Electrophoretic data give  $p_H$  5.22 as the isoelectric point. F. A. A.

**Lacto-mannitic enzymes. IV. Influence of the medium on the fermentation of glucose and fructose.** V. BOLGATO (Annali Chim. Appl., 1936, 26, 423—427; cf. A., 1936, 628).—If the medium is maintained at  $p_H$  7—8, glucose and fructose yield the same products of fermentation, viz., lactic acid, AcOH, EtOH, and  $\text{CO}_2$ . L. A. O'N.

**Leucocyte phosphatases.** N. FIESSINGER and F. BOYER (Enzymologia, 1936, 1, 172—176).—Leucocytes from oxalated plasma and exudates have a monophosphoesterase activity  $\times$  that of serum.

E. D. Y.

**Plant phosphatases. II. Activation of taka-phosphoesterase by substances of similar con-**

stitution. E. BAMANN and W. SALZER (Biochem. Z., 1936, 288, 299—300).—The activation of the phosphoesterase of *Aspergillus oryzae* by citric acid also occurs with other acids with  $\cdot\text{CO}\cdot\text{CO}_2\text{H}$  or  $\cdot\text{CH}(\text{OH})\cdot\text{CO}_2\text{H}$ . F. O. H.

Preparation of phosphoglyceric and glycerophosphoric acids by decomposition of hexose diphosphate by yeast. A. HAHN, H. OTTAWA, and E. MEHLER (Z. Biol., 1936, 97, 573—577).—Phosphoglyceric (I) and glycerophosphoric acid (II) were prepared from the fermentation mixture of Vercellone and Neuberg (A., 1935, 1418). After removal of the yeast the solution is made alkaline with aq.  $\text{NH}_3$  and  $\text{PO}_4'''$  is pptd. by  $\text{Mg}(\text{OAc})_2$ . (I) and (II) are pptd. from the filtrate by  $\text{Pb}(\text{OAc})_2$ . The Pb salts are decomposed by  $\text{H}_2\text{S}$  and (I) is pptd. as the acid Ba salt. (II) is again pptd. as the Pb salt, and after decomp. with  $\text{H}_2\text{S}$  is pptd. as the quinine salt. (I) also gives a quinine salt (m.p. 199°). E. A. H. R.

Effect of temperature, variety of juice, and method of increasing sugar content on maximum alcohol production by *Saccharomyces ellipsoides*. L. HOHL and W. V. CRUESS (Food Res., 1936, 1, 405—411).—Tomato juice attained the highest EtOH content (15.1%) by "straight fermentation" and grapefruit juice (17.8%) by "syruped fermentation." Grape juice is superior to pure sugars in syruping the fermentation. EtOH formation is max. at 20—22° and decreases rapidly at 30—37°.

P. G. M.

Transformation of furfuraldehyde by fermenting yeast. P. LIANG (Z. physiol. Chem., 1936, 244, 238—240; cf. Lintner *et al.*, A., 1911, ii, 816).—The substance believed to be  $\alpha$ -furyl trimethylene glycol yields furfuraldehyde (I) and MeCHO on oxidation with  $\text{Pb}(\text{OAc})_4$  and hence is  $\alpha$ -furyl methyl glycol (II) which with  $\text{COMe}_2$  and  $\text{P}_2\text{O}_5$  yields the isopropylidene derivative, b.p. 193.5—194.5°/712 mm. Probably (II) is produced during the fermentation from the condensation product of (I) and MeCHO by hydrogenation. W. McC.

Action of 4-quinolinepyruvic acid on yeast. C. NEUBERG and G. MINARD (Enzymologia, 1936, 1, 161—167).—Decarboxylation of  $\text{AcCO}_2\text{H}$  by yeast and yeast extracts is unaffected by 4-quinolinepyruvic acid (I). The Na salt inhibits. (I) stimulates  $\text{CO}_2$  production from glucose. E. D. Y.

Trehalose and yeast. I. K. MYRBACK and B. ORTENBLAD (Biochem. Z., 1936, 288, 329—337).—Press-yeast (except from brewer's bottom yeast) contains, in addition to trehalose (I), small amounts of a more complex carbohydrate. The rate of fermentation of (I) by freshly prepared dried yeast and Lebedev's yeast-juice is approx. 25% of that of glucose (II); with old dried yeast, the rates are equal. Apo- and co-enzyme ferment (I). The fermentation characteristics of (I) and (II) are compared.

F. O. H.

Trehalose formation in cell-free alcoholic fermentation. H. SOBOTKA and M. HOLZMAN (Enzymologia, 1936, 1, 168—171).—Glucose metabolised by Lebedev juice is only partly oxidised to  $\text{CO}_2$ . A non-reducing, strongly dextrorotatory substance resembling trehalose is formed. E. D. Y.

*Zygosaccharomyces pini*, a new species of yeast associated with bark beetles in pines. E. C. HOLST (J. Agric. Res., 1936, 53, 513—518).—The yeast is described. Among the common sugars only glucose, fructose, and mannose are fermented.

A. G. P.

Preparation of crude bios V, and its influence on the reproduction of certain micro-organisms. M. E. ELDER (Trans. Roy. Soc. Canada, 1936, [iii], 30, III, 89—97; cf. A., 1936, 522).—Tannin ppts. bios V from tomato juice together with traces of bios IIA and IIB which have no effect on the reproduction of *S. cerevisiae*; boiling  $\text{Ca}(\text{OH})_2$  destroys V, which is completely adsorbed on C. *S. valbyensis* does not reproduce in presence of crude V and IIA, or crude IIB, but does so with inositol and crude IIB; IIA favours the process. With crude bios V and "bios V reagent" [i.e., bios V treated with  $\text{Ca}(\text{OH})_2$  and with the Ca removed], the crop of *S. cerevisiae* is and that of *S. valbyensis* a little > when V, inositol, IIA, and IIB are used, showing that some other unknown constituent is concerned in the reproduction of these organisms. Bios V is determined by its effect on the reproduction of yeast in presence of excess of bios V reagent if the organism count (24 hr.) is < 1300. A method for obtaining MeOH solutions of V from tomato juice is described. EtOH trebles the yield of yeast in presence of V and V reagent (cf. A., 1922, i, 501). MeOH,  $\text{Pr}^n\text{OH}$ , and glycerol have no effect. Bios requirements of various organisms for rapid reproduction are described; their individuality in this respect is apparent. J. L. D.

Wildier's bios. W. L. MILLER (Trans. Roy. Soc. Canada, 1936, [iii], 30, III, 99—103).—Tomato juice, treated with tannin and Pb acetate, contains 70% of the original bios. Norite removes IIB, which is eluted with  $\text{COMe}_2$ -aq.  $\text{NH}_3$ ; treatment of the eluent with Hg and Cu acetates, MeOH, and BuOH affords a prep. of IIB. The solution, freed from IIB, is treated with Cu and Hg acetates and then contains 80% of the original IIA. The yeast crop in media containing glucose, salts, inositol, and IIB is much increased when  $\beta$ -alanine (cf. A., 1936, 896) and  $\gamma$ -L-leucine, alone of many  $\text{NH}_2$ -acids, are added. The properties of IIA are probably due to these acids. J. L. D.

Preparation of galac yeast. G. W. KIRBY and L. ATKIN (J. Biol. Chem., 1936, 116, 511—513).—The prep. of a galactose-containing medium from lactose is described; bakers' yeast grown on this medium yields galac (i.e. galactose-fermenting) yeast.

F. A. A.

Transformation of lactic acid by moulds. T. CHRZĄSZCZ and R. SCHILLAK (Biochem. Z., 1936, 288, 359—368).—All the moulds examined (species of *Penicillium*, *Dermatium*, *Monilia*, *Rhizopus*, *Aspergillus*, and *Mucor*) utilise lactic acid (I) (as Ca salt) with production of  $\text{EtCO}_2\text{H}$ ,  $\text{AcOH}$ ,  $\text{PrCO}_2\text{H}$ , MeCHO, and, except most species of *Aspergillus*,  $\text{HCO}_2\text{H}$ . With some moulds, citric acid, EtOH, or  $\text{COMe}_2$  is formed. The moulds were divisible into three groups according to their mode of metabolising (I) and to the resultant end-products.

F. O. H.

Biochemistry of micro-organisms. LII. Isolation, properties, and constitution of tefrestic

acid (ethylcarolic acid), a metabolic product of *Penicillium terrestre*, Jensen. J. H. BIRKINSHAW and H. RAISTRICK (Biochem. J., 1936, 30, 2194—2200).—Three different strains of *P. terrestre*, Jensen, produce from Raulin-Thom glucose medium a monobasic acid (I),  $C_{11}H_{14}O_4$ , m.p.  $89^\circ$ ,  $[\alpha]_{D_{581}}^{20} +61.1^\circ$  in  $H_2O$ . On acid hydrolysis it yields  $CO_2$  and acetoin as well as a lactone shown to be *l-hexolactone*, b.p.  $219^\circ$  (uncorr.),  $[\alpha]_{D_{581}}^{20} -58.11^\circ$ . Hence (I) is an ethylcarolic acid and its hydrate is  $\alpha$ -(*l*- $\gamma$ -hydroxy-*n*-hexoyl)-*l*- $\gamma$ -methyltetronic acid. F. A. A.

Effect of synthetic vitamin- $B_1$  on a micro-organism. W. H. SCHOPFER (Ber. deut. bot. Ges., 1936, 54, 559—560).—Synthetic  $B_1$  produces the same growth-stimulating effect on *Phycomyces* as do natural preps. A. G. P.

Cation antagonism in cultures of *Saprolegnia*. F. MOREAU (Compt. rend., 1936, 203, 809—811; cf. A., 1936, 1149).—KCl-MgCl<sub>2</sub> and KCl-CaCl<sub>2</sub> mixtures were less toxic to the organism than equiv. solutions of either salt alone. For each mixture there is a definite proportion at which toxic effects are min. Antagonism is very marked between K<sup>+</sup> and Ca<sup>++</sup>. A. G. P.

Composition of beetroot tumours caused by *B. tumefaciens*. A. BERTHELOT and G. AMOUREUX (Compt. rend. Soc. Biol., 1936, 123, 942—944). H. G. R.

Glutathione and ascorbic acid content of beetroot tumours caused by *B. tumefaciens*. A. BERTHELOT and G. AMOUREUX (Compt. rend. Soc. Biol., 1936, 123, 944—946).—The contents of glutathione and ascorbic acid are increased in the infected tissue. H. G. R.

Optical properties of fermentation lactic acids. V. Action of acetone-butyl alcohol-producing organism on optically active lactic acids. H. KATAGIRI and K. KITAHARA (J. Agric. Chem. Soc. Japan, 1936, 12, 1217—1220; cf. A., 1936, 1419).—*Cl. acetobutylicum* causes racemisation of lactic acids by the action of racemase. E. M. W.

Biological properties of *Bacterium typhi flavum*. I. MALEK (Compt. rend. Soc. Biol., 1936, 123, 923—925).—The organism belongs to the colityphoid group and more closely resembles the saprophytes. H. G. R.

Influence of variable quantities of asparagine and glycerol on the growth of bovine *B. tuberculosis* and on the  $p_H$  of cultures in Sauton's medium. R. K. GOYAL (Compt. rend. Soc. Biol., 1936, 123, 871—873).—The max. growth is obtained with 0.5% of asparagine (I) or 6% (vol.) of glycerol (II). With concns. of (I) between 0.1 and 0.5% the culture remains acid but above this val. becomes alkaline. Cultures containing 0.5—1% of (II) become alkaline. H. G. R.

Action of salts on bacteria. M. INGRAM (Rep. Food Invest. Bd., 1935, 53—57).—The respiration of certain micrococci and bacilli is increased by addition of  $>0.05M$ -NaCl, and diminished by  $>0.05M$ . No difference was observed in the behaviour of organisms tolerating, and those not tolerating, high concns.

of salt.  $NaNO_3$  decreased the  $O_2$  uptake, being itself reduced to  $NaNO_2$ . E. C. S.

Neutralising action of adrenaline hydrochloride on tetanus toxin *in vitro*. R. BOISEAU (Compt. rend. Soc. Biol., 1936, 123, 1077—1078). H. G. R.

Ultracentrifugal crystallisation of tobacco mosaic virus protein. R. W. G. WYCKOFF and R. B. COREY (Science, 1936, 84, 513).—A cryst. virus protein is directly obtained when the juice of plants infected with the tobacco mosaic disease is centrifuged at 25,000 r.p.m. The X-ray pattern is indistinguishable from that of the protein prepared from the juice by chemical means. L. S. T.

Liquid crystalline substances from virus-infected plants. F. C. BAWDEN, N. W. PIRIE, J. D. BERNAL, and I. FANKUCHEN (Nature, 1936, 138, 1051—1052).—By further purification of the cryst. protein possessing the properties of tobacco mosaic virus (cf. A., 1936, 1562) the protein in aq. solution (concn.  $>2\%$ ) separates into a lower liquid cryst. layer and an upper layer which shows anisotropy of flow. The liquids form gels on drying, and X-ray analysis shows a common pattern corresponding with a repeat unit of  $3 \times 22.2 \pm 0.02$  A. in the cryst., liquid, and gel stages; hexagonal close-packing is indicated in the gel stage, and parallel, charged, rod-like mols. in the solution. The length of the mols. is  $>1000$  A. and the width approx. 0.1 of the length. This gives a min mol. wt. in agreement with Svedberg's estimate of  $17 \times 10^6$ . These rods are probably the virus particles. L. S. T.

Immunology of mosaic diseases. IV. Effects of acetone, lead subacetate, barium hydroxide, aluminium hydroxide, trypsin, and soils on the antigenic property of tobacco mosaic juice. T. MATSUMOTO and K. SOMAZAWA (J. Soc. Trop. Agric. Taiwan, 1934, 6, 671—682).—Serological tests with partly purified virus, freed from accretions by treatment with appropriate reagents, showed that the antigenic property of the mosaic juice persisted for the duration of infectivity. Although trypsin destroys the infectivity of the virus only when the latter is treated with  $COMe_2$  previous to contact with the enzymes, the antigenic property remains unimpaired in  $COMe_2$ -treated and control juices. CH. ABS. (p)

Ultrafiltration of the virus of equine encephalomyelitis. J. H. BAUER, H. R. COX, and P. K. ORITSKY (Proc. Soc. Exp. Biol. Med., 1935, 33, 378—382).—The virus passes through collodion membranes having average pore diameter 66  $m\mu$  but not through those of 60  $m\mu$ . W. McC.

Second form of the virus of foot and mouth disease. G. PYL (Z. physiol. Chem., 1936, 244, 209—217).—The naturally occurring virus is stable in neutral solution only but is irreversibly converted by acid and alkali into a second infectious form stable only in acid and alkaline solution. The conversion probably consists in an alteration of the virus itself and not in an alteration of accompanying material. The viruses of smallpox and chicken cholera do not behave analogously. W. McC.

Ultrafiltration and approximate dimensions of the virus of Nicholas-Favre disease. C. LEVADITI, M. PAIC, and D. KRASSNOFF (Compt. rend. Soc. Biol., 1936, 123, 1048—1050).—With increasing virulence a decrease in size was observed, that of the most virulent strain being 100—140 mu.

H. G. R.

Approximate size of the standard (Paris) virus of rabies and the virus of street rabies of dogs. C. LEVADITI, M. PAIC, and D. KRASSNOFF (Compt. rend. Soc. Biol., 1936, 123, 866—868).—Ultrafiltration curves give an approx. particle size of 140—210 and 160—240 mu for the two viruses, respectively.

H. G. R.

Propagation of rabies virus in tissue culture and the successful use of culture virus as an antirabic vaccine. L. T. WEBSTER and A. D. CLOW (Science, 1936, 84, 487—488).—Cultivation of rabies virus in tissue culture is described. When used as a vaccine, the culture virus protects mice against "street rabies" virus. After a single peritoneal injection dogs remain healthy and produce neutralising antibodies in their sera against the homologous "street" virus strain within 14 days.

L. S. T.

Preservation of viruses with saturated sodium chloride solution. F. C. LIN, T. J. KUBOTSCHIKIN, and C. V. BERNARADSKY (Proc. Soc. Exp. Biol. Med., 1935, 33, 332—334).—Rinderpest virus suffers no attenuation during 4 weeks' contact with the solution. The potency of vaccine virus decreases in 5 weeks' contact to almost the same extent as does the virus in glycerol. The potency of dysentery Shiga bacteriophage preserved in the solution for >3 months is 400 times that of untreated virus.

W. McC.

Purification of bacteriophage and a respiratory pigment in *Escherichia coli communis*. K. MEYER, R. THOMPSON, D. KHORAZO, and J. W. PALMER (Proc. Soc. Exp. Biol. Med., 1936, 33, 129—133).—A method of purification is described. A violet-red pigment, characteristic of the strain, was isolated by way of the phosphotungstate from a 0.05N-NaOH extract of COME<sub>2</sub>-dried bacteria.

P. G. M.

Effect of  $p_H$  on heat-inactivation of bacteriophage. A. P. KREUGER and E. J. SCRIBNER (Proc. Soc. Exp. Biol. Med., 1936, 33, 21—23).—Heat-inactivation of bacteriophage is minimal at  $p_H$  7.5 and is characteristic of protein denaturation as in the case of some enzymes.

P. G. M.

Effect of sublethal doses of monochromatic ultra-violet radiation on bacteria in liquid suspensions. A. HOLLAENDER and J. T. CURTIS (Proc. Soc. Exp. Biol. Med., 1936, 33, 61—62).—The growth of irradiated cultures is retarded but on completion of growth the same no. of organisms is present as in the control.

P. G. M.

Freezing and death of bacteria. R. B. HAINES (Rep. Food Invest. Bd., 1935, 31—34).—The death rate of *B. pyocyaneus* in the frozen state is at a max. at  $-2^\circ$ . *Staphylococcus aureus* and the spores of various organisms for the most part survive rapid freezing to  $-70^\circ$ . Other vegetative cells vary in their resistance to this treatment.

E. C. S.

Effect of pure ozone on bacteria. R. B. HAINES (Rep. Food Invest. Bd., 1935, 30—31).—Growth of *B. coli* in Nelson's medium is retarded by 4 p.p.m. of O<sub>3</sub> in the atm. and prevented by 10 p.p.m., the O<sub>3</sub> being admitted simultaneously with inoculation. When growth is established, >200 p.p.m. are needed to arrest it.

E. C. S.

Resistance of bacteria and embryonic tissue to germicides. VI. Iodine trichloride. A. J. SALLE and A. S. LAZARUS (Proc. Soc. Exp. Biol. Med., 1936, 33, 8—9).—ICl<sub>3</sub> is relatively non-toxic to chick heart tissue but is > twice as toxic to *Staphylococcus aureus*, the toxicity index being 0.4.

P. G. M.

Resistance of bacteria and of embryonic tissue to germicides. VII. Potassium mercuric iodide. A. J. SALLE and A. S. LAZARUS (Proc. Soc. Exp. Biol. Med., 1935, 33, 393—395; cf. preceding abstract).—K<sub>2</sub>HgI<sub>4</sub> is much more toxic than PhOH to *S. aureus* and to heart tissue of the chick embryo.

W. McC.

Inhibitory action of sodium citrate on the bactericidal power of human blood. A. GRIMBERG, S. MUTERMILCH, and E. AGASSE-LAFONT (Compt. rend. Soc. Biol., 1936, 123, 1045—1048).—Whilst 2% of Na citrate partly inhibits the growth of coliform bacilli, 3% inhibits the bactericidal power of the blood.

H. G. R.

Mode of action of *p*-aminobenzenesulphonamide and prontosil in hæmolytic streptococcal infections. L. COLEBROOK, G. A. H. BUTTLE, and R. A. Q. O'MEARA (Lancet, 1936, 231, 1323—1326).—*p*-NH<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·SO<sub>2</sub>·NH<sub>2</sub> (I) has a bacteriostatic and bactericidal action against small numbers of hæmolytic streptococci in culture medium and in blood. Prontosil (II) is active only after reduction. After injection of (I) or (II), the blood of man or animals is bactericidal to hæmolytic streptococci.

L. S. T.

Effect of acids on carbocyclic antiseptics. F. W. HARTMAN and V. SCHELLING (Proc. Soc. Exp. Biol. Med., 1935, 33, 469—471).—The bactericidal effect of amyltricrosol and similar compounds is increased, frequently greatly, by addition of tannic acid or HCl (at  $p_H$  2—3), compounds effective against certain groups of bacteria only often being made effective against all groups.

W. McC.

Photodynamic action of methylene-blue on bacteria. T. TUNG (Proc. Soc. Exp. Biol. Med., 1935, 33, 328—330).—The bactericidal action of saturated aq. methylene-blue in ordinary electric light varies widely with the micro-organism used, the resistance of Gram-negative organisms being apparently > that of Gram-positive.

W. McC.

Protein metabolism in experimental adrenal insufficiency. S. THADDEA (Arch. exp. Path. Pharm., 1936, 184, 105—107).—In cats after bilateral adrenalectomy, the blood-residual N is increased, the increase being reversed by simultaneous injection of ox hormone (pancortex). Urinary N excretion is decreased after extirpation, the effect being also reversed on administration of hormone.

P. W. C.

Sodium and water metabolism in relation to disturbances of carbohydrate metabolism after

**adrenalectomy.** F. VERZAR and L. LASZT (Nature, 1936, 138, 844).—In rats the selective absorption of glucose (I) is inhibited after adrenalectomy, and ingestion of (I) produces loss of Na<sup>+</sup> and H<sub>2</sub>O into the intestine with consequent diarrhoea. The effect may be lethal, but can be prevented by simultaneously giving Na salts. The results may be related to that previously observed (A., 1936, 1567) with vitamin-B<sub>2</sub> on adrenalectomised animals. L. S. T.

**Effect of continuous intravenous injections of adrenaline in Addison's disease.** A. BAUDOUIN, E. AZÉRAD, and J. LEWIN (Compt. rend. Soc. Biol., 1936, 123, 858—859).—No increase in blood pressure was observed. H. G. R.

**Adrenal cortex and fat transport.** F. VERZAR and L. LASZT (Biochem. Z., 1936, 288, 356—358).—The depletion of fat from the liver of P-poisoned rats (A., 1936, 1018) is prevented (and the liver-fat may increase to twice the normal val.) by administration of adrenal cortex hormone, flavinphosphoric acid, or yeast preps. F. O. H.

**Adrenal cortex and fat absorption.** L. LASZT and F. VERZAR (Biochem. Z., 1936, 288, 351—355).—That diminished fat absorption in adrenalectomised rats is reinstated by administration of adrenal cortex hormone (I) is confirmed (cf. A., 1936, 1018). The rate of absorption is not increased above normal levels by (I) in either normal or adrenalectomised rats. The action of flavinphosphoric acid preps. (vitamin-B<sub>2</sub>) resembles that of (I). F. O. H.

**Test for adrenal cortex hormone and ascorbic acid in guinea-pigs treated with diphtheria toxin.** W. HERBRAND (Endokrinol., 1935, 16, 236—237; Chem. Zentr., 1936, i, 1247—1248).—Injection of "pancortex" with ascorbic acid prevented death of toxin-treated animals. Standardised treatment permits determination of the hormone. A. G. P.

**Use of pituitary stains : numerical ratios in the anterior epithelium : reciprocal relations.** A. L. BURGDORF (Endokrinol., 1935, 16, 148—160; Chem. Zentr., 1936, i, 1247).—Relations between the proportions of acidophile, primary, and basophile cells are examined. A. G. P.

**Action of the carbohydrate-metabolism hormone of the anterior pituitary on the saturated and unsaturated fatty acids of the liver.** K. J. ANSELMINO, G. EFKEKEMANN, and F. HOFFMANN (Z. ges. exp. Med., 1935, 97, 44—50; Chem. Zentr., 1936, i, 1446).—The hormone, which is obtained from blood after carbohydrate ingestion or from aq. extracts of the anterior pituitary by ultrafiltration at  $p_H$  5.3, effects a decrease in the unsaturated and total fatty acids of the liver and a decrease in glycogen. The action on glycogen reaches max. earlier than that on the acids. A. G. P.

**Effect of the parathyrotropic hormone of the anterior pituitary in different animals.** K. J. ANSELMINO, L. HEROLD, and F. HOFFMANN (Z. ges. exp. Med., 1935, 97, 51—59; Chem. Zentr., 1936, i, 1445—1446).—Rats are the most suitable animals for evaluating the hormone. A. G. P.

**Quantitative studies with the thyrotropic hormone [of anterior pituitary gland].** W. K. CUYLER, B. F. STIMMEL and D. R. McCULLAGH (J. Pharm. Exp. Ther., 1936, 58, 286—293).—Injection of the hormone decreases the I content of the thyroid glands of guinea-pigs considerably but affects immature rats only slightly. The rate of metamorphosis of tadpoles is accelerated by very small doses. E. M. W.

**Pituitary hormone antagonism.** S. L. LEONARD, F. L. HISAW, and H. L. FEVOLD (Proc. Soc. Exp. Biol. Med., 1935, 33, 319—321).—The action of antuitrin S in stimulating the development of the ovaries of immature hypophysectomised rats is inhibited by certain extracts of the anterior lobe of the pituitary gland. The inhibiting substance is associated with the luteinising hormone, but luteinising extracts are not always inhibitory. W. O. K.

**Elaboration of hormones by pituitary cells growing *in vitro*.** E. ANDERSON and W. HAYMAKER (Proc. Soc. Exp. Biol. Med., 1935, 33, 313—316).—When cultured *in vitro* the pars intermedia cells of the posterior lobe of the pituitary continued to produce the melanophore-expanding substance. Production of hormones by anterior lobe cells growing *in vitro* could not be detected. W. O. K.

**Inhibition of action of pituitary hormones by animal sera.** K. W. THOMPSON and H. CUSHING (Proc. Roy. Soc., 1936, B, 121, 501—517).—Prolonged injection of gonadotropic extracts produced in canine sera a principle which antagonised the action of the hormone in other animals. The antagonistic principle is not species-sp. The possibility of formation of an antibody or of an antihormone in the dog or in the subsequently treated animal is considered. A. G. P.

**Thyrotropic pituitary hormone.** P. STARR (Proc. Soc. Exp. Biol. Med., 1935, 33, 462—464).—In healthy persons, ovariectomised women, and persons suffering from goitre the increase in the basal metabolic rate produced by injecting the hormone exhibits great variations in degree. Hyperthyroidism is sometimes temporarily exacerbated by the hormone. W. McC.

**Relationship of precipitin titres to gonadotropic inhibitory action of monkey sera.** E. L. GUSTUS, B. K. MEYER, and J. H. DINGLE (Proc. Soc. Exp. Biol. Med., 1935, 33, 257—261).—Repeated injection of highly purified gonadotropic hormone, prepared from the serum of pregnant mares, into female monkeys produced in the serum of the latter a sp. inhibitory substance (I) and occasionally small amounts of precipitin (II). (I) and (II) are probably not identical. W. O. K.

**Purification of gonad-stimulating principle from serum of pregnant mares.** A. E. MEYER (Proc. Soc. Exp. Biol. Med., 1935, 33, 433—436).—A simple method is described. Loss of approx. 33% of the principle is involved. W. McC.

**Gonadotropic substance in the blood of normal humans.** S. C. FREED (Proc. Soc. Exp. Biol. Med., 1935, 33, 309—310).—Normal human blood-serum from males or females contains small quantities of

a substance similar to "prolan B," the presence of which may be demonstrated by means of its synergistic effect with suitable anterior pituitary extracts.

W. O. K.

**Occurrence of an oestrogenic substance in the sexual skin of monkeys.** R. B. FISHER, P. L. KROHN, and S. ZUCKERMAN (Biochem. J., 1936, **30**, 2219—2223).—Monkeys and baboons, injected with oestrone, show marked swelling of the sexual skin and genitals. The occurrence of compounds having oestrogenic activity is shown in the active sexual skin and its exudate, and in the liver.

F. A. A.

**Poliocidal property of pregnant mare serum.** C. W. JUNGBLUT (Proc. Soc. Exp. Biol. Med., 1936, **33**, 137—141).—The presence of poliocidal substances in the serum of pregnant mares is related to pregnancy but cannot be correlated with the gonadotropic hormone content.

P. G. M.

**Oestriolglycuronide.** S. L. COHEN, G. F. MARIAN, and A. D. ODELL (Biochem. J., 1936, **30**, 2250—2256; cf. A., 1936, 503).—Improvements in the method of extraction previously described enable the yield of the glycuronide (I), m.p. 196—236° [Na salt,  $C_{24}H_{31}O_9Na + 0.5MeOH$ , m.p. approx. 305° (decomp.), and  $+1.5H_2O$ , m.p. approx. 256° (decomp.),  $[\alpha]_{D}^{25} -28.2^\circ$  to  $-21.0^\circ$  in  $H_2O$ ], to be increased to 0.5 g. from 30 litres of human pregnancy urine. Spectrographic examination of (I) and isolation of the Me ether of oestriol (II) from the products of hydrolysis of methylated (I) indicate that the phenolic OH of (II) is free in (I). In adult ovariectomised mice (I) has a potency of 370 mouse units per mg.

W. McC.

**Effect of oestrogenic hormones on lactation and on the phosphatase of the blood and milk of the lactating cow.** S. J. FOLLEY (Biochem. J., 1936, **30**, 2262—2272).—Administration of oestrone and of dihydrofollicular hormone benzoate to lactating cows causes temporary decrease in the milk yield dependent on increase in the amount of oestrogenic hormone in the blood, prolonged increase in the fat and non-fatty solids content of the milk, very great increase, of short duration, in the phosphatase content of the milk, and temporary decrease in the Ca content of the blood-serum but no secretion of colostrum.

W. McC.

$\Delta^5$ -Androsten-17-ol-3-one.—See A., II, 64.

**Uterine response to dihydrotheelin.** H. W. MARLOW (Science, 1936, **84**, 377).—Dihydrotheelin has a greater effect than theelin on hypertrophy of the uterus.

L. S. T.

**Preparation from urine of concentrates of follicle-stimulating hormone.** E. BRAND, R. J. BLOCK, M. M. HARRIS, and L. E. HINSIE (Proc. Soc. Exp. Biol. Med., 1935, **33**, 360—363).—After adjusting the  $p_H$  of the urine to 4.5 the hormone (I) is adsorbed on  $Al(OH)_3$  which is then washed with  $COMe_2$  and dried. Aq. NaOH at  $p_H$  10—10.5 is used for elution.  $\approx 60\%$  of (I) is recovered.

W. McC.

**Progestin in cows' corpora lutea.** G. G. KIMURA (Proc. Soc. Exp. Biol. Med., 1936, **33**, 97—

99).—Fresh cows' corpora lutea contain 14 rabbit units of progestin per kg. as determined in adult castrate female rabbits. Vals. are lower in glands which are not fresh. Fresh sows' corpora lutea give a yield of 30—50 units per kg.

P. G. M.

**Crystalline progesterone from pig ovaries.** W. M. ALLEN and C. GOETSCH (J. Biol. Chem., 1936, **116**, 653—662).—The MeOH extract of the ovaries is diluted with  $H_2O$  and extracted with light petroleum (b.p. 55—65°). 25% of the hormone in the tissue can be isolated in the pure state.

J. N. A.

**Detection and determination of corpus luteum hormone.** P. HOLTZ (Arch. exp. Path. Pharm., 1936, **184**, 74—75).—After 6 injections of follicular hormone into immature guinea pigs (150—160 g.) pro-oestrus-oestrus resulted. This was inhibited when 0.005 mg. of progesterone was simultaneously injected. The method thus detects 0.03 mg. of corpus luteum hormone and is 30 times more sensitive although less sp. than the rabbit test.

P. W. C.

**Corpus luteum hormone action of placenta extract.** C. VAN LANKEREN (Arch. Gynakol., 1935, **160**, 150—158; Chem. Zentr., 1936, i, 1648).

H. J. E.

**Hormones of the corpus luteum system.** A. VON PROBSTNER (Endokrinol., 1935, **16**, 174—179; Chem. Zentr., 1936, i, 1246).—In a case of corpus luteum tumour the cysts contained a considerable proportion of prolan-B and little follicular hormone (I). In another case the cyst contained much (I) but no corpus luteum hormone.

A. G. P.

**Quantitative extraction of sex hormones from urine.** T. F. GALLAGHER, F. C. KOCH, and R. I. DORFMAN (Proc. Soc. Exp. Biol. Med., 1935, **33**, 440—444).—The male and female hormones are quantitatively removed from normal urines by hydrolysis with HCl for 2 hr. and extraction in a special apparatus with 10 vols. of  $C_6H_6$ . The hormones are separated by shaking with aq. NaOH. An alternative procedure for isolating the male hormone by adsorption on diatomaceous earth is described.

W. McC.

**Gonadotropic substance in urine of normal children.** S. C. FREED (Proc. Soc. Exp. Biol. Med., 1936, **33**, 35—36).—Amounts of gonadotropic substance equiv. to those present in the urine of adults are found in the urine of prepubertal children; its properties differ from those of the hormone in postmenopausal urine but resemble those of the hormone of pregnancy urine.

P. G. M.

**Hormone content of the urine of women during the normal sexual cycle and in amenorrhoea; extraction of the hormone.** R. BOMPIANI and M. DAVID (Rass. Clin. Terap., **32**, 319—348; Chem. Zentr., 1936, i, 1445).—The folliculin content of urine varied considerably in amenorrhoea. Vals. were paralleled by those in serum, and in normal conditions reached max. 9 days after the commencement of menstruation.

A. G. P.

**Urinary elimination of folliculin.** G. TATA (Rass. Clin. Terap., 1935, **34**, 265—270; Chem. Zentr., 1936, i, 1445).—Vals. were low in amenorrhoea but

returned to normal with the reappearance of menstruation.

A. G. P.

**Activation of male sex hormones.** I, II. K. MIESCHER, A. WETTSTEIN, and E. TSCHOPP (Biochem. J., 1936, 30, 1970—1976, 1977—1990).—I. The effects of testosterone (I) on castrated rats are increased, in some cases very greatly, by addition of fatty acids (40 tested), those normal saturated acids with about C<sub>10</sub> having the least and those with about C<sub>16</sub> the greatest effects. Saturated or unsaturated OH-acids are usually more effective than are acids without OH. Palmitic acid (II) does not activate *cis*- and *trans*-androsterone and androstenedione: its effect is most pronounced with (I) and similar hormones [e.g., methyltestosterone and androstane-3-*cis*-17-*trans*-diol] which have OH in the 17-*trans*-position and also OH or an  $\alpha\beta$ -unsaturated CO at 3. Wetting agents and monohydric alcohols activate (I), stearyl being more effective than oleyl. Acid fractions from testes contain in addition to (II) other more effective constituents. The natural activator is possibly a mixture of acids which differ only quantitatively in activating power.

II. Amongst esters of (I) the most effective in promoting growth of the capon's comb are those of the lower fatty acids. The intensity of action decreases rapidly in the higher acids and the effect becomes more prolonged. The palmitate, stearate, and benzoate are almost without effect. In the rat test the activity of the esters of the lower acids greatly exceed that of (I), max. intensity and duration being attained with the esters of Pr<sup>c</sup>CO<sub>2</sub>H, Pr<sup>b</sup>CO<sub>2</sub>H, and Bu<sup>c</sup>CO<sub>2</sub>H. The palmitate and stearate are ineffective in rats. The effects of the esters of (I) and androsterone are not, in general, increased by addition of acids although the low activity of (I) acetate in 50% glycerol is increased by ricinoleic acid. It is proposed that, in addition to capon units, rat units should be introduced, that max. effects should be compared independently of time of occurrence, and that duration of effect should be separately characterised.

W. McC.

**Inhibitory effect of testosterone propionate on experimental prostatic enlargement.** S. ZUCKERMAN (Lancet, 1936, 231, 1259—1262).—Testosterone propionate in sufficient amount inhibits the action of castrone on the prostate of the rhesus monkey, and is more potent than testosterone, androstenediol, or progesterone.

L. S. T.

**Chloroketone from male urine.**—See A., II, 65.

**Sex hormones.** XVIII. Preparation of further enol-esters from ketones of the cholestane and androstene series. XIX. Preparation of  $\Delta^5$ -3-*epi*hydroxyandrostene-17-one.—See A., II, 65.

**Effect of zinc and aluminium on the hypoglycaemic action of insulin.** J. F. FAZEKAS and H. E. HIMWICH (J. Pharm. Exp. Ther., 1936, 58, 260—263).—The hypoglycaemic action of insulin is prevented by simultaneous injection of Zn<sup>++</sup> or Al<sup>+++</sup> but not by separate injection or by Ca<sup>++</sup> or Mg<sup>++</sup>. EtOH reduces but prolongs the hypoglycaemia. E. M. W.

**Effect of insulin on the course of alimentary hyperglycaemia and hyperalcoholaemia curves.** H. SCHLICHTING (Z. ges. exp. Med., 1935, 97, 60—64; Chem. Zentr., 1936, i, 1447).—Oral administration of EtOH to rabbits increases the blood-EtOH to an extent which is almost as great in insulin (I)-treated as in untreated animals. Simultaneous administration of sugar produces lower vals. in the (I)-treated animals. The subsequent decline in blood-EtOH is more rapid than that in blood-sugar. (I)-sugar treatment of acute EtOH poisoning is indicated.

A. G. P.

**Absence of thiolhistidine from insulin.** V. DU VIGNEAUD, R. H. SIFFERD, and G. MILLER (Proc. Soc. Exp. Biol. Med., 1935, 33, 371—373).—The S of thiolhistidine and of zein but not that of cystine, glutathione, methionine, or homocystine is oxidised by Br to inorg. SO<sub>4</sub><sup>''</sup>. Cryst. insulin before and after hydrolysis with HCl (with or without subsequent reduction) yields no inorg. SO<sub>4</sub><sup>''</sup> on oxidation with Br.

W. McC.

**Distribution of calcium in the brain of normal and thyroparathyroidectomised rats.** S. FARAGÓ (Biochem. Z., 1936, 288, 393—401).—Thyroparathyroidectomy in rats increases [Ca] of the cerebrum and cerebellum but diminishes that of the medulla. Subsequent administration of thyroxine has no effect on the levels but parathyroid preps. produce a return to a more normal distribution although the individual vals. remain > normal.

F. O. H.

**Endocrines in theory and practice. Chemistry of the thyroid gland.** C. R. HARRINGTON (Brit. Med. J., 1936, No. 3963, 1269—1271).—A review.

A. G. P.

**Effect of thyroidectomy on blood-lipins.** E. M. BOYD (Trans. Roy. Soc. Canada, 1936, [iii], 30, V, 11—17).—Sub-total thyroidectomy in man causes an increase in all plasma-lipins, the increase being in the order neutral fat > cholesterol > cholesteryl esters > phospholipins. The increase often is not > the limits of the normal range. There is no increase in the lipin content of the red blood cells. J. N. A.

**Effect of dietary fats on the action of thyroid extract.** S. LOUMOS (Proc. Soc. Exp. Biol. Med., 1935, 33, 424—426).—In rats receiving the extract the rate of loss of wt. is slightly diminished by giving lard but is increased by giving "Crisco."

W. McC.

**Transference of hormones in milk.** S. KONSULOFF (Endokrinol., 1935, 16, 237—240; Chem. Zentr., 1936, i, 1248).—Measurements of CO<sub>2</sub> production by rats indicate that powdered thyroidin administered to the mother is rapidly transferred to the suckling.

A. G. P.

**Dehydrogenation process in animal tissues after thyroxine treatment.** M. REISS, L. SCHWARTZ, and F. FLEISCHMANN (Endokrinol., 1935, 16, 145—148; Chem. Zentr., 1936, i, 1446).—Anaerobic dehydrogenation in liver tissue is greater in thyroxine-treated than in normal animals. It is also increased by fasting or fatigue. The effect is ascribed to the formation of donators during mobilisation of glycogen.

A. G. P.

**Ratio of dehydroascorbic acid to ascorbic acid in tissues after administration of thyroxine.** E. MARTINI and F. COPELLO (Biochim. Terap. sperim., 1935, 22, 529—535; Chem. Zentr., 1936, i, 1447).—In livers and adrenals of guinea-pigs dehydroascorbic acid increases and ascorbic acid decreases after thyroxine treatment. Vitamin-C and the redox potential of the tissues increase as a result of the greater  $O_2$  consumption. A. G. P.

**Tyrosine and thyroxine.** I. ABELIN (Klin. Woch., 1935, 14, 1777—1781; Chem. Zentr., 1936, i, 1649).—The antagonistic influence of tyrosine on the physiological action of thyroxine is examined. A. G. P.

**Action of thyroxine on heart muscle metabolism.** H. BERG (Arch. exp. Path. Pharm., 1936, 184, 104—105).—The decrease of conductivity of heart muscle after thyroxine treatment is accompanied by fission of adenyl pyrophosphate. P. W. C.

**Action of thyroxine on muscle-glycolysis. Fermentable, reducing sugar during glycolysis.** P. E. GRÉGOIRE (Compt. rend. Soc. Biol., 1936, 123, 1029—1032).—The increased glycolysis of thyroxinised muscle results in a decrease in the glucose content. H. G. R.

**Production of thyroxine by iodination of protein.**—See A., II, 40.

**Multiple nature of the growth hormone.** R. W. BATES, T. LAANES, and O. RIDDLE (Proc. Soc. Exp. Biol. Med., 1935, 33, 446—450).—The growth of dwarf mice is promoted by desiccated thyroid, prolactin, and thyrotropic hormone, the last two exhibiting synergism. The growth hormone is probably not a single substance. W. McC.

**Vitamin deficiency, infection, and prevention of disease.** L. OELRICHS (Z. Hyg., 1935, 117, 684—710; Chem. Zentr., 1936, i, 1251). A. G. P.

**Vitamin-A and carotene.** XIII. Vitamin-A reserve of the adult human being in health and disease. T. MOORE. XIV. Vitamin-A reserves of the human infant and child in health and disease. J. B. ELLISON and T. MOORE. XV. Influence of vitamin-A reserve on the length of the depletion period in the young rat. A. W. DAVIES and T. MOORE. XVI. Effect of the administration of large amounts of vitamin-A on the vitamin-A content of the hen's egg. E. M. CRUICKSHANK and T. MOORE (Biochem. J., 1937, 31, 155—164, 165—171, 172—178, 179—187).—XIII. The vitamin-A content of adult human liver varies widely in health; the median val. was 220 international units per g. of wet tissue. Lower median vals. were obtained in groups representing a wide range of diseases.

XIV. The -A content of the liver is very low at birth, rises sharply in the earliest months, and is then static through childhood. The median val. in health was 140 international units per g. but lower in various diseases.

XV. Rats fed after weaning on an -A-rich diet showed high liver reserves, falling steadily on a vitamin-deficient diet over a long period through which growth was maintained. A group on vitamin-poor

diet had low reserves, disappearing rapidly with rapid cessation of growth. Growth and positive liver reactions reappeared on giving halibut-liver oil. The reality of vitamin storage is demonstrated although its relation to the period of survival on a deficient diet is only qual.

XVI. Copious addition of the vitamin to ordinary diet gave some increase in -A content of the yolk and enormous accumulation in the hen's body. The yolk content fell to normal on return to normal supply; the body stores fell more slowly. -A accumulates in the kidney but < in the liver.

R. M. M. O.

**Seasonal variations of the vitamin-A reserve and the motor chronaxie in guinea-pigs.** A. CHEVALLIER, Y. CHORON, and L. ESPY (Compt. rend. Soc. Biol., 1936, 123, 909—910).—In spring, when there is a vitamin-A reserve in the liver, the chronaxie val. is > that in the autumn when the reserve is lower. H. G. R.

**Vitamins and catalysts in wheat embryos.** H. VON EULER and M. MALMBERG (Arkiv Kemi, Min., Geol., 1936, 12, B, No. 14, 6 pp.).—Wheat embryo is rich in fat-sol. growth-promoting factors. The vitamin-A content is < that required to bring about the growth observed. Dehydrogenases in the embryo belong mainly to the class requiring flavin-enzyme and cozymase for their action. E. A. H. R.

**Vitamin-B complex.** R. A. PETERS (Brit. Med. J., 1936, No. 3957, 903—905).—A review.

A. G. P.

**Enzymic efficiency in avitaminosis.** B. SURE, M. C. KIK, and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, 33, 78—80).—In vitamin-B deficiency there is a decrease in pancreatic lipase (I) and esterase (II) and an increase in serum-phosphatase. In -A deficiency a decrease in serum-(II) is accompanied by an increase in liver-(I). No disturbance of protein or starch digestion occurs in either -A or -B deficiency.

P. G. M.

**Biological methods for vitamin-B complexes.** C. A. ELVEHJEM (J. Assoc. Off. Agric. Chem., 1936, 12, 595—598; cf. *ibid.*, 1935, 18, 354).—The method described previously gives uniform results in the hands of different workers. Chicks are sensitive to differences of 0.25% of yeast in the ration. E. C. S.

**Blood-alcohol curve and experimental beri-beri.** A. GALAMINI (Atti R. Accad. Lincei, 1936, [vi], 23, 623—626).—Ingestion of EtOH by pigeons suffering from B-avitaminosis produces an increased blood-EtOH level for periods > that with normal birds.

F. O. H.

**Pyruvic acid oxidation in brain.** I. Vitamin- $B_1$  and the pyruvate oxidase in pigeon's brain. R. A. PETERS (Biochem. J., 1936, 30, 2206—2218).—Review of previous data together with fresh evidence lead to the view that lactate is directly oxidised to pyruvate (I) in pigeon's brain, and that the action of vitamin- $B_1$  is specifically related to the further oxidation of (I). The two oxidase systems can be separated at acid reactions, and - $B_1$  and (I) are necessary to ensure stability of (I) oxidase at  $p_H$  6.6.

F. A. A.

**Resorption of vitamin-B in the small intestine.** A. SCHEUNERT and M. SCHIEBLICH (Ber. Verh. Sachs. Akad. Wiss., math.-phys. Kl., 1935, 87, 179—184; Chem. Zentr., 1936, i, 1650).—Vitamin- $B_1$  is readily resorbed (66%) from dried or living yeast cells in the small intestine.  $-B_2$  is similarly resorbed.

A. G. P.

**Vitamin- $B_1$  and thyroxine.** B. SURE and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, 33, 77—78).—75—100% of normal growth was obtained on a daily dose of 0.05 mg. thyroxine (I) with administration of 7.5—15 Sherman units of  $-B_1$  concentrate. With a daily dose of 0.2 mg. of (I) loss of wt. was prevented by 30 units of  $-B_1$ , but little growth took place. Less growth was obtained with higher doses of cryst. vitamin.

P. G. M.

**Avitaminosis. XVII. Influence of high-fat diets on vitamin- $B_1$  requirements.** B. SURE and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, 33, 75—76).—High-fat diets do not reduce the amount of vitamin- $B_1$  required even with an ample supply of  $-B_2$  and protein (cf. A., 1935, 415).

P. G. M.

**Detection and determination of vitamin- $B_1$ .** H. J. PREBLUDA and E. V. MCCOLLUM (Science, 1936, 84, 488).—Vitamin- $B_1$  and the product obtained by the action of  $\text{HNO}_2$  on *p*-amino-acetanilide or -acetophenone gives a characteristic, stable, purple-red compound insol. in  $\text{H}_2\text{O}$ .

L. S. T.

**Determination of aneurine (vitamin- $B_1$ ) by the thiochrome reaction.** B. C. P. JANSEN (Rec. trav. chim., 1936, 55, 1046—1052).—Aneurine hydrochloride (I) in 0.1 ml. of  $\text{H}_2\text{O}$  is shaken with 0.1% aq.  $\text{K}_3\text{Fe}(\text{CN})_6$  [0.01—0.1 ml. for 1, 0.03—0.1 ml. for 10, or 0.1—0.2 ml. for  $20 \times 10^{-6}$  g. of (I)], 3 ml. of 10% NaOH are added, and after 1—2 min. the solution is extracted with 13 ml. of  $\text{Bu}^n\text{OH}$  and centrifuged. The thiochrome (II) in the  $\text{Bu}^n\text{OH}$  layer is determined by measuring the fluorescence photo-electrically. Conversion of (I) into (II) is nearly quant. The amount of  $\text{K}_3\text{Fe}(\text{CN})_6$  taken has less influence in MeOH, and reaction in MeOH instead of  $\text{H}_2\text{O}$  thus gives better results in certain cases.

R. S. C.

**Oxygen uptake and composition of skin of rats in vitamin- $B_2$  deficiency.** P. A. ADAMS (J. Biol. Chem., 1936, 116, 641—651).—The  $\text{O}_2$  consumption falls to a much lower level than in normal rats of the same age. The difference is not caused by inanition.  $\text{O}_2$  uptake per mg. of phospholipin (I) of skin also falls. The total fat content diminishes, whilst the (I) content slightly increases.

J. N. A.

**Influence of vitamins on the water-affinity of blood. I. Ascorbic acid.** J. FLIEDERBAUM and R. TISCOWITZ (Z. ges. exp. Med., 1935, 97, 121—126; Chem. Zentr., 1936, i, 1651).—Intravenous administration of ascorbic acid increases the colloid-osmotic pressure in dog blood, and corrects the lowered pressure resulting from experimental adrenal insufficiency.

A. G. P.

**Anaphylactic shock and vitamin-C.** A. HOCHWALD (Z. ges. exp. Med., 1935, 97, 433—439; Chem. Zentr., 1936, i, 1451).—Injection of ascorbic acid 2 hr. before shock treatment eliminates the shock.

Glutathione acts similarly. Histamino-shock was not affected.

A. G. P.

**Relationship of vitamin-C to glucose tolerance in the guinea-pig.** A. SIGAL and C. G. KING (J. Biol. Chem., 1936, 116, 489—492).—The fasting blood-sugar level in guinea-pigs is increased, and the glucose tolerance lowered, by 10 days of vitamin-C depletion. Re-administration of -C is followed by a return to normal, within 15 days.

F. A. A.

**Biological oxidations. VII. Oxidation of ascorbic acid in biological fluids.** E. S. G. BARRON, A. G. BARRON, and F. KLEMPERER (J. Biol. Chem., 1936, 116, 563—573).—Fluids of animal origin, and those of vegetable origin which contain considerable amounts of ascorbic acid (I), protect (I) against oxidation. This is due to the presence in them of glutathione, proteins, or  $\text{NH}_2$ -acids, which form complexes with Cu, and hence inhibit catalysis by  $\text{Cu}^{++}$ . Haemochromogens also catalyse the oxidation of (I); this reaction is inhibited by  $\text{CN}^-$ .

F. A. A.

**Seasonal variations in the ascorbic acid content of the organs of the frog.** E. NESFOR (Compt. rend. Soc. Biol., 1936, 123, 928—929).—The ascorbic acid content of the various organs of frogs kept under laboratory conditions from October to April is < that of those collected in March.

H. G. R.

**Relations between diet and urinary output of thiosulphate (and ascorbic acid). Human requirements for vitamin-C.** M. HEINEMANN (Biochem. J., 1936, 30, 2299—2306).—The total reducing capacity of urine rises and falls with the protein intake and depends chiefly on the  $\text{S}_2\text{O}_3^{--}$  output. Cystine taken with a low-protein diet has the same effect on the urinary reducing capacity as have high protein diets. If the urinary ascorbic acid (I) output is determined, however, after pptn. with  $\text{Hg}(\text{OAc})_2$  its amount is not influenced by the proportion of the dietary protein. The daily requirement of (I) for man is 60 mg. for a body-wt. of 70 kg. An essentially smaller amount is, however, sufficient to prevent scurvy.

P. W. C.

**Relation between body-weight of pigs and ascorbic acid, cathepsin, and amylase content of liver.** G. SCOZ and L. DE CARO (Enzymologia, 1936, 1, 199—208).—The rate of increase in body-wt. of normal, fasting, and thyroxine- and di-iodotyrosine-treated pigs cc the ascorbic acid content of the liver. Catheptic activity is min. and amylolytic activity is max. with a normal growth rate.

E. D. Y.

**Vitamin-C requirement of mice, and its biological formation.** I. S. KLEINER and H. TAUBER (Food Res., 1936, 1, 399—404).—Growth is retarded by oral administration of large quantities of ascorbic acid (I) (10% of the diet), although more food is consumed. Mice on a diet containing 0.1% of (I) grow better than those on a (I)-deficient diet. Neither extracts of rat and beef tissues nor various moulds, *B. xylinum*, etc. can convert sugars into (I).

P. G. M.

**Vitamin-C studies in the rat and guinea-pig.** J. L. SVIRBELY (J. Biol. Chem., 1936, 116, 543—

553).—Feeding with salts of Cu, Be, Pb, As, Hg, Cd, Co, Mn, Th, or  $\text{UO}_2$  does not prevent synthesis of vitamin-C in the rat. The body contains a protective mechanism preventing catalytic oxidation of -C by Cu. Org. compounds are likewise without effect, except those containing halogen. Vals. are given of the relative wts. of, and the concns. of -C in the liver and gut under the above conditions. A high-Na diet does not affect the survival time or scorbutic symptoms of guinea-pigs deprived of -C.

F. A. A.

**Synthesis of ascorbic acid by the human foetus.** A. GIROUD, R. RATSIMAMANGA, M. RABINOWICZ, A. S. RUIZ, and I. CESA (Compt. rend. Soc. Biol., 1936, **123**, 1038—1040).—The ascorbic acid content of the 3—4 months foetus is > that at term.

H. G. R.

**Ascorbic acid content of the ovary and corpus luteum at various stages of the oestrous cycle.** A. A. POLICARD and M. FERRAND (Compt. rend. Soc. Biol., 1936, **123**, 1081—1084).—The ascorbic acid content of the corpus luteum runs parallel with the physiological cycle and is a max. 8—15 days after ovulation.

H. G. R.

**Vitamin-C content of the human tonsil.** M. M. CLAYTON and J. D. KEITH (Science, 1936, **84**, 377—378).—The vitamin-C content of 54 persons, mainly children, ranged from 10.6 to 47.6 mg. per 100 g. of tissue. The -C contents of diet and tonsils appear to be related.

L. S. T.

**Vitamin-C content of the ejaculate of the guinea-pig.** D. ZIMMET and P. SAUSER-HALL (Compt. rend. Soc. Biol., 1936, **123**, 584—586).—The ejaculate contains approx. 0.054 mg. per g. Reduced glutathione is absent.

H. G. R.

**Storage of ascorbic acid in organs of guinea-pigs after ingestion of the crystalline acid with a vitamin-C-free diet.** E. JACOBSEN (Skand. Arch. Physiol., 1935, **72**, 259—264; Chem. Zentr., 1936, i, 1451).—Rates of storage of ascorbic acid after feeding the cryst. acid to -C-depleted animals are examined.

A. G. P.

**Amount of ascorbic acid in blood and urine. Daily human requirements for ascorbic acid.** M. VAN EEKELLEN (Biochem. J., 1936, **30**, 2291—2298).—Curves showing the variation of ascorbic acid (I) content of blood and urine in a normal man under various conditions are given. Saturation of the organism with (I) coincides with a kidney threshold val. of 0.0013%. The daily dose required by adults weighing 70 kg. is about 60 mg. under normal conditions.

P. W. C.

**Urinary excretion of ascorbic acid in the dog following ether anaesthesia.** D. E. BOWMAN and E. MUNTWYLER (Proc. Soc. Exp. Biol. Med., 1935, **33**, 437—438).—Excretion is increased following  $\text{Et}_2\text{O}$  anaesthesia.

W. McC

**Vitamin-C in pasteurised milk.** P. F. SHARP (Science, 1936, **84**, 461—462).—Pasteurisation for 30 min. at 62—63° (holder method) causes slight destruction of the enzyme which oxidises ascorbic acid (I) and satisfactory bacterial destruction without injuring creaming ability. Heating at 77° for >0.5

min. destroys the enzyme and creaming ability. Milk can be pasteurised by the holder method and maintain essentially as high a (I) content as that of raw milk of the same age. Contamination with Cu must be avoided. By using higher temp. it is possible to produce pasteurised milk which when kept will have a (I) content > of raw milk of the same age.

L. S. T.

**Effect of light on the vitamin-C of milk.** S. K. KON and M. B. WATSON (Biochem. J., 1936, **30**, 2273—2290).—Milk giving a positive test for ascorbic acid (I) fails to reduce indophenol reagent after exposure to daylight through glass. The reducing power is restored to a varying extent by treatment with  $\text{H}_2\text{S}$  but irreversible losses occur. Short- $\lambda$  light (blue, violet) is chiefly responsible for the reaction; yellow or red light is without action and ultra-violet light is probably active. The effect is not obtained in the absence of  $\text{O}_2$ . Dehydroascorbic acid is formed in the reversible oxidation and the lactone ring is opened in the further irreversible changes. Synthetic (I) added to milk behaves in the same way. Tests on guinea-pigs shows that the substance produced in the reversible oxidation is biologically active but those in the irreversible reaction are inactive. Pasteurisation destroys the reversibly oxidised, but does not affect the reduced form of, (I). Milk secreted by normal cows contains only reduced (I) and the amount of destruction of (I) by pasteurisation depends on the previous exposure of the milk to light.

P. W. C.

**Biosynthesis of ascorbic acid.** B. C. GUHA and B. GHOSH (Nature, 1936, **138**, 844—845).—The increase in ascorbic acid content which results when rat tissue or an aq. extract of germinated *Phaseolus mungo* is incubated with mannose in a closed vol. of air (A., 1935, 131, 416, 903) has been confirmed. In  $\text{N}_2$  the increase does not occur, which explains the negative results of Euler *et al.* (A., 1936, 255).

L. S. T.

**State of ascorbic acid in plant tissues.** L. F. LEVY (Nature, 1936, **138**, 933; cf. A., 1936, 1429).—Determinations of ascorbic acid (I) in cauliflower and potato after extraction in several ways support the view that (I) exists partly in a combined state and is liberated during boiling. On the other hand, oxidases are active during boiling and reduce the amount of (I).

L. S. T.

**Vitamin-C in vegetables. IV. Ascorbic acid oxidase.** Z. I. KERTESZ, R. B. DEARBORN, and G. L. MACK (J. Biol. Chem., 1936, **116**, 717—725).—Ascorbic acid oxidase (I) is generally present in vegetables, and is completely inactivated by heating at 100° for 1 min. Losses of physiologically active forms of ascorbic acid (II) are caused by its enzymic oxidation to dehydroascorbic acid, which is more readily decomposed than is (II) to compounds having no antiscorbutic activity. More (II) is retained in vegetables if the (I) is destroyed by heat. As (I) and catalase (III) are inactivated by heat at the same rate, the extent of inactivation of (I) can be determined by measuring the (III) activity.

E. A. H. R.

**Factors influencing ascorbic acid content of apples.** E. N. TODHUNTER (Food Res., 1936, **1**, 435—442).—Apples contain 0.5—1.5 international units of ascorbic acid (I) per g., which they lose slowly on storage at  $>0^{\circ}$ . The skin contains more (I) than the pulp. Titration with 2:6-dichlorophenol-indophenol gives similar results to the biological method on the whole fruit, but lower results on the pulp. P. G. M.

**Metabolism of ascorbic acid in the apple fruit.** S. S. ZILVA, F. KIDD, and C. WEST (Rep. Food Invest. Bd., 1935, 110—111).—In young apples a great part, if not all, of the ascorbic acid is present in the reversibly oxidised form. E. C. S.

**Role of vitamin-C in the growth of higher plants.** S. VON HAUSEN (Biochem. Z., 1936, **288**, 378—392; cf. A., 1936, 391).—The formation of vitamin-C in plants (peas, clover) is favoured by adequate provision of N, either from  $\text{NO}_3^-$  or root nodule-bacteria, and by optimal  $[\text{K}^+]$  (0.025% of KCl) and  $[\text{PO}_4^{4-}]$  [0.025% of  $\text{Ca}_3(\text{PO}_4)_2$ ]. Addition of -C to culture solutions, especially before formation of leaves, increases the dry-wt., growth, and -C content of plants; the action is sp. for -C and does not occur with glucose. Pea-seeds, germinated for 7 days and stripped of their cotyledons, produce leaves only after treatment with -C. F. O. H.

**Vitamin-C. XVIII. Effect of light in its production.** T. MATSUOKA (J. Agric. Chem. Soc. Japan, 1936, **12**, 1203—1210).—Light is not essential for but greatly increases the production of vitamin-C in growing plants. E. M. W.

**Determination of ascorbic acid as furfuraldehyde and comparison of results obtained by this method and by indophenol titration.** J. H. ROE (J. Biol. Chem., 1936, **116**, 609—619).—The method, which can be used for plant and animal tissues, consists in the determination of the furfuraldehyde (I) (colorimetrically with  $\text{NH}_2\text{Ph}$  in presence of  $\text{SnCl}_2$  and  $\text{AcOH}$ ) formed by boiling an acid extract of the tissue [in which the ascorbic acid (II) has been oxidised by treatment with C] with HCl alone and with  $\text{HCl-SnCl}_2$ . The difference between the two vals. gives the amount of (I). The method gives results in agreement with the indophenol titration, except in the case of liver where the latter method gives results 25% higher. In all tissues examined, (II) exists in the reduced form only. The method is highly sp. J. N. A.

**Antiscorbutic properties of methyl 2-ketogluconate.** A. E. SIEHRS, P. GOTTARDO, F. G. BRAZDA, and C. O. MILLER (Proc. Soc. Exp. Biol. Med., 1935, **33**, 422—423).—Me 2-ketogluconate (20—100 mg. daily) protects guinea-pigs against scurvy and 50—100 mg. per day cures them. W. McC.

**Pro-vitamin-D potency of some sterol derivatives.** E. M. KOCH and F. C. KOCH (J. Biol. Chem., 1936, **116**, 757—768).—The contaminant of spinal cord-cholesterol (I) which has four absorption bands is probably 7-dehydrocholesterol (II) (cf. A., 1936, 120). The provitamin-D of heated, purified (I) is not (II) as it remains after the elimination of the four

bands. The two double linkings in ring B are not alone responsible for antirachitic activity, the presence and configuration of side groups also influencing the potency. In the prep. of (II) according to Windaus *et al.* (A., 1935, 1363), two other products having antirachitic activity were obtained differing from (II) in m.p. and  $[\alpha]$ . E. A. H. R.

**Pro-vitamin of the sterol of eggs.** A. WINDAUS and O. STANGE (Z. physiol. Chem., 1936, **244**, 218—220).—Cholesterol from dried Chinese egg-yolks contains small amounts of ergosterol (I) separated by repeated adsorption on  $\text{Al}_2\text{O}_3$ . (I) is probably derived from the food of the hens. W. McC.

**Enrichment of vitamin-D from tunny-liver oil.** O. NERACHER and T. REICHSTEIN (Helv. Chim. Acta, 1936, **19**, 1382—1391).—Methods, involving partition, adsorption, and reaction with  $\alpha\text{-C}_6\text{H}_4(\text{CO})_2\text{O}$  for obtaining rapidly concentrates containing 20% of vitamin-D are detailed. These concentrates afford *dinitrobenzoates*, (a)  $\text{C}_{27}\text{H}_{40}\text{O}_7\text{N}_2$ , m.p.  $202^{\circ}$  (corr.), (b)  $\text{C}_{27}\text{H}_{33}\text{O}_6\text{N}_2$ , m.p.  $181.5\text{—}182.5^{\circ}$  (corr.), and (c), m.p.  $113^{\circ}$ ; these can be hydrolysed only by  $\text{Na}_2\text{SnO}_2$ ; the resultant alcohols are physiologically inactive. R. S. C.

**Single-dose technique for the assay of vitamin-D.** R. L. EDWARDS (Chem. and Ind., 1936, 983; cf. this vol., 46).—The healing of rickets in rats on Steenbock's diet 2965 following the administration of a single dose of vitamin-D increases rapidly to a max. in 10 days, and then declines. Rats receiving the same total of -D as 10 daily doses continue healing at least until the 14th day; on the 7th—10th days, healing by the two methods is about the same, which probably explains the results obtained by Coward and Key (A., 1934, 931). F. A. A.

**Biological methods for assay of vitamin-D carriers.** W. B. GRIEM (J. Assoc. Off. Agric. Chem., 1936, **19**, 585—588).—Four weeks' feeding is sufficient to demonstrate vitamin-D deficiency in chicks by the tibia ash method. The protective dose is  $>27$  U.S.P. units of -D from cod-liver oil per 100 g. of basal ration. E. C. S.

**Biological methods for vitamin-D carriers.** L. L. LACHAT (J. Assoc. Off. Agric. Chem., 1936, **19**, 598—602).—In determining the % of bone ash a standardised analytical procedure must be strictly adhered to. E. C. S.

**Determination of vitamin-D. V. X-Ray diagnosis and ash determination of bone calcification, and blood mineral analyses in White Leghorn chicks.** H. A. HALVORSON and L. L. LACHAT. VI. Comparative vitamin-D requirement of the chick for sardine (pilchard), concentrated, and cod-liver oils, irradiated yeast, irradiated ergosterol, and irradiated cholesterol. L. L. LACHAT and H. A. HALVORSON. VII. Effect of age, sex, size, and calcification in young chicks on accuracy of preventive bioassay. L. L. LACHAT (J. Assoc. Off. Agric. Chem., 1936, **19**, 628—637, 637—646, 647—670; cf. A., 1936, 1430).—V. The % Ca and Mg of blood-plasma do not vary consistently, and the % inorg. P varies only slightly with the age of the chick and the amount or kind

of vitamin-D supplement used. Of the methods examined, determination of the ash of the tibia is most satisfactory, and by this means deficiency of -D can be detected in 2 weeks (cf. preceding abstract).

VI. Irradiated cholesterol and U.S.P. reference cod-liver oil are equal in promoting growth and bone calcification when 28 U.S.P. units of -D from each per 100 g. of A.O.A.C. ration per chick are fed for 4 weeks, but irradiated ergosterol and irradiated yeast fail to produce a normally calcified bone even at 50 times this activity. Irradiation for 20 min. of A.O.A.C. ration supplemented with maize oil produces definite, but slightly subnormal, calcification.

VII. The data obtained from >2000 chicks are examined statistically. Deficiency of -D was more marked in respect of calcification than of growth, but determination of the latter has a supplementary val. Calcification did not decrease with deficiency of -D until the chicks were 3 weeks old, but, with sufficient vitamin, increase occurred before this age. Differences in calcification were most pronounced at 3 and 4 weeks. The test period may be reduced from 4 to 3 weeks.

E. C. S.

**Deficiency diet for investigation of vitamin-E.** L. SCHIOPPA (Ann. Igiene, 1935, 45, [N.S. 18], 315—319; Chem. Zentr., 1936, i, 1653).

A. G. P.

**Nutritional requirements of mosquito larvæ (*Aedes aegypti*).** W. TRAGER (Amer. J. Hyg., 1935, 22, 475—493).—Two accessory food substances are necessary for the yellow-fever mosquito. One is present in aq. extracts of yeast and in egg white and whole wheat. It is stable to heat and alkali and is not adsorbed by fullers' earth. The second is found in liver extracts rich in vitamin-B<sub>2</sub>, is decomposed by alkali, is thermostable, and adsorbed by fuller's earth and animal C at  $p_H$  5—7. Liver extracts potent against secondary anaemia but poorly effective against pernicious anaemia contain the second accessory substance.

CH. ABS. (p)

**Elaboration of carbonaceous matter by plants in an aqueous medium.** M. T. GERTRUDE (Compt. rend., 1936, 203, 811—813).—Photosynthesis in *Veronica anagallis* was more active in plants grown under H<sub>2</sub>O than in those in air. Elaboration of carbonaceous matter was substantially the same in both cases.

A. G. P.

**Plant nucleoli.** G. YAMAHARA and S. SUEMATSU (Sci. Rep. Tokyo Bunrika Daigaku, 1936, 3, 21—34).—Nucleoli bear a negative charge. Changes in the nucleal reaction of the various elements of the nucleus and the distribution of nucleic acid during karyokinesis are examined.

A. G. P.

**Absorption by roots.** P. MAZÉ and P. J. MAZÉ, jun. (Compt. rend. Soc. Biol., 1936, 123, 939—941). Absorption is ionic and the rate depends on the nature of the ionic charge.

H. G. R.

**Structure of the wall of algæ of the genus *Halicystis*.** G. VAN ITERSOM, jun. (Proc. K. Akad. Wetensch. Amsterdam, 1936, 39, 1066—1074).—The wall consists of substances showing the reactions of amyloid matter and callose.

A. G. P.

**Importance of ash elements in the cultivation of excised root tips.** W. J. ROBBINS, V. B. WHITE, J. E. McCLARY, and M. BARTLEY (Proc. Nat. Acad. Sci., 1936, 22, 636—639).—The beneficial effect of additions of agar or filter-paper on the growth of excised tips in mineral salt-glucose media is attributable to their ash constituents.

A. G. P.

**Mathematical expression of equilibrium between nitrogen and phosphoric acid in plants.** W. THOMAS (Science, 1936, 84, 422—423).—Deviations from the optimum physiological balance between N and P<sub>2</sub>O<sub>5</sub> in four differently treated plots are shown and discussed.

L. S. T.

**Photochemical oxidation of plant materials.** S. V. DESAI and FAZAL-UD-DIN (Indian J. Agric. Sci., 1936, 6, 985—990).—Dried and powdered berseem plants (*Trifolium alexandrinum*) catalysed the photo-chemical oxidation of NH<sub>2</sub>Et to NO<sub>2</sub>, the action being unaffected by preheating the plant material to 125°. The catalytic principle was present to a greater extent in leaves and roots than in stems and was almost entirely H<sub>2</sub>O-sol. Fructose, glucose, maltose, cryst. and amorphous preps. of chlorophyll, but not crude fibre, cotton cellulose, or starch catalysed the reaction. CO<sub>2</sub> retarded the photo-oxidation of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> in the presence of ZnO. The temporary increase in the NO<sub>2</sub> content of grass following fertilisation with (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (Eggleston, A., 1935, 1037) may be due to photo-oxidation of NH<sub>4</sub> within the plants.

A. G. P.

**Photochemical processes in biology. I. Principal photochemical reactions and their reaction mechanisms.** G. DE TONI (Biochim. Terap. sperim., 1935, 22, 547—555; Chem. Zentr., 1936, i, 1438).—A general survey.

H. N. R.

**Influence of temperature treatment on carbohydrate metabolism, respiration, and morphological development of the tulip. III.** L. ALGERA (Proc. K. Akad. Wetensch. Amsterdam, 1936, 39, 1106—1114; cf. this vol., 48).—Relative changes in concns. of reducing and non-reducing sugars in bulbs during cool storage and after planting are explained by a shifting of the equilibrium of enzymic processes with temp.

A. G. P.

(A) Respiration and water content of seeds. R. GANE. (B) Uptake of water by grains of maize. A. J. M. SMITH. (C) Water relations of pea seeds. A. J. M. SMITH and R. GANE (Rep. Food Invest. Bd., 1935, 135—137, 137—138, 138—139).—(A) The respiration of soaked peas and wheat grains reaches a steady val. after 24 hr. This val. increases with the H<sub>2</sub>O content of the seed from 0.25 mg. of CO<sub>2</sub> per kg. per hr. (15°) to 250 mg. in the fully-soaked seed.

(B) The H<sub>2</sub>O content of seeds is adjusted to various levels by soaking to equilibrium in aq. LiCl of varying concn.

(C) Peas dried over CaCl<sub>2</sub> to zero H<sub>2</sub>O content and so stored were superior in colour and in their capacity to take up H<sub>2</sub>O to commercial air-dried peas. They did not, however, soften so readily on cooking.

E. C. S.

**Effect of folliculin on plants.** C. ZOLLIKOFER (Ber. deut. bot. Ges., 1936, 54, 507—516).—Treatment of *Poa alpina* var. *intermedia* with cryst. folliculin improved flowering and tillering. Complete nutrients in  $H_2O$  cultures induced similar effects.

A. G. P.

**Occurrence and transport of a substance causing flowering in soya bean (*Glycine max.*, L.).** J. KULTER and L. K. WIERSUM (Proc. K. akad. Wetensch. Amsterdam, 1936, 39, 1114—1122).—Grafting a flowering scion on a "long-day" stock (i.e. with no tendency to flower) causes lateral flower buds to develop on the stock. A "short-day" stock causes flowering on a "long-day" scion. The active substance concerned passes through the graft. Transport is more rapid in a basal than in an apical direction.

A. G. P.

**Growth hormones in plants.** M. M. JANOT (Bull. Soc. Chim. biol., 1936, 18, 1741—1768).—A lecture.

**Growth-substance and plagiotropic movement in *Parthenocissus*.** W. ZIMMERMANN (Ber. deut. bot. Ges., 1936, 54, 496—506).—The curvature of the growing tips of vine shoots is related to the differential distribution of growth-substance and is dependent on the cross-sectional polarity of the shoot.

A. G. P.

**Growth-substance curvatures of *Avena* in light and dark.** J. VAN OVERBEEK (J. Gen. Physiol., 1936, 20, 283—309).—Growth-substance curvatures of *Avena* coleoptiles show that a decrease in growth rate follows exposure to light if auxin-A, but not if heteroauxin, is used. This is due to the more rapid oxidative inactivation of auxin-A. Small amounts of light markedly inhibit the formation of growth hormone in the decapitated coleoptile.

F. A. A.

**Stimulation of root-formation on lucerne cuttings.** G. W. BURTON (J. Amer. Soc. Agron., 1936, 28, 704—705).—Naphthylacetic acid was superior to indolylacetic acid in stimulating the formation of adventitious roots on cuttings. Tip cuttings formed more roots than those taken lower down the stem, whether these were treated or not. Excessive amounts of the growth-substance injured the cuttings.

A. G. P.

**Nature and control of potato virus diseases.** P. A. MURPHY (Nature, 1936, 138, 955—956).

L. S. T.

**Chemical composition of non-manured mulberry leaves.** K. SUDA (Bull. Sericult. Japan, 1936, 9, 77—84).—The  $H_2O$  and protein contents and  $Et_2O$  extract of non-manured mulberry leaves were < and the sol. N-free extract and carbohydrate, and crude fibre and ash were > those of manured trees.

E. M. W.

**Chemical constituents of food plants for true and wild silkworms, *Bombyx mori*, *Antheraea Yamamai*, and *A. pernyi*.** T. NAKASONE and Y. MIDORIKAWA (Bull. Sericult. Japan, 1936, 9, 69—76).—The food plants of domesticated and wild silkworms differ considerably in  $H_2O$ , sugar, and protein content.

E. M. W.

**Distribution of calcium, phosphorus, and iron in leafy vegetables.** C. F. WANG (Chinese J. Physiol., 1936, 10, 651—656).—Data are given for the distribution of Ca, Fe, and P in 11 kinds of vegetables grown in the Moukden district. The content of Ca, Fe, or P in spring is > that in autumn (cf. Hsu and Adolph, A., 1935, 797).

F. A. A.

**Determination of the internal gases of plant tissues.** C. W. CULPEPPER, H. H. MOON, and J. M. LUTZ (Science, 1936, 84, 398—400).

L. S. T.

**Bismuthate method for determining manganese in plant material.** R. NARAIN and A. SINGH (Indian J. Agric. Sci., 1936, 6, 757—766).—The gravimetric method for Mn often yields high results in analysis of plant materials. The volumetric Na bismuthate method is satisfactory for HCl-extracts of plant ash. Accuracy is improved by use of  $HNO_3$  carefully freed from nitrous fumes, and by removal of all traces of HCl before oxidation. Removal of  $H_2SO_4$  prior to oxidation is unnecessary.

A. G. P.

**Determination of ammonia in green plants.** F. ALTEN, B. WANDROWSKI, and E. KNIPPENBERG (Bodenk. Pflanzenernahr., 1936, 2, 120—125).— $NaOH$  and  $Ba(OH)_2$  decompose  $NH_3$ -acids and acid amides in plant material during distillation of  $NH_3$ . A borate buffer which on dilution (1 : 2—3) has  $pH$  9.0 is suitable for liberating  $NH_3$ . Loss of  $NH_3$  accompanies pptn. of protein from plant saps by tannin. Ground fresh plant tissue mixed with  $H_2O$  and stored in an ice chamber gives a quant. yield of  $NH_3$  on subsequent analysis. Ground plant material treated with PhMe may be stored in ice for several days without decomp. Plants dried at  $55^\circ$  give high and those at  $110^\circ$  low results in  $NH_3$  determinations.

A. G. P.

**Determination of the nitrate contents of plant substances as nitroxylol.** F. ALTEN, B. WANDROWSKY, and E. HILLE (Bodenk. Pflanzenernahr., 1936, 1, 340—348).—The method of Treschow and Gabrielsen (B., 1934, 112) can be utilised for 1-g. samples of plant materials, if the nitration is effected at room temp. with 25 c.c. of 66%  $H_2SO_4$ . After 20 min. the mixture is diluted with 60 c.c. of  $H_2O$  and 45 c.c. of the liquid are distilled into 0.2N- $NaOH$ . The distillate may be clarified by shaking with  $BaSO_4$ . A correction for colouring matter other than nitroxylol which may appear in the distillate is determined from a "blank" test in which xylolol is omitted.

A. G. P.

**Ethereal oils of the rhizomes of *Languas* (*Alpinia*) varieties.** A. J. ULTEE (Rec. trav. chim., 1936, 55, 993—999).—The rhizomes of (a) *L. (A.) Romburghiana*, Val., (b) *L. Schumanniana*, Sasaki (*A. Schumanniana*, Val.), and (c) *L. speciosa*, Small (*A. speciosa*, K. Sch.), gave 0.08, 0.08, and 0.13%, respectively, of oils,  $d^{16}_4$  0.9759,  $d^{18}_4$  0.9365,  $d^{19}_4$  0.9221;  $n^{16}_D$  1.5152,  $n^{18}_D$  1.4782, 1.4740;  $[\alpha]^{16}_D + 8.4^\circ$ ,  $[\alpha]^{18}_D + 46.24^\circ$ ,  $[\alpha]^{19}_D - 10.51^\circ$ , acid val. 2, 9, 1; ester val. 137, 38, 27; sap. val. 139, 47, 28, respectively, containing (a, b, c) *l*- $\alpha$ - and *l*- $\beta$ -pinene; (a, b) *d*-camphene; cineole (a) 9.7, (b) 0, (c) 60.2; *d*-camphor (a) 6.3, (b) 31.7, (c) 0, *d*-borneol (a) 12.9, (b) 12.5, (c) 0, and Me cinnamate (a) 40, (b) 0, and (c) 7.8%, respectively.

R. S. C.

**Chemical nature of citrin.** V. BRUCKNER and A. SZENT-GYORGYI (Nature, 1936, **138**, 1057).—Citrin (I) (A., 1936, 1162) consists of hesperidin (II) with an eriodictoyl glucoside in minor amount. The reactivity and colour reactions of (I) are due to the latter. (I) contains no free eriodictoyl. Eriodictoyl glucoside is not found in any large amount in unripe oranges, which, however, contain large amounts of (II), indicating that the glucoside is formed from (II) by demethylation on ripening of the fruit. L. S. T.

**Glutathione in wheat germ.** B. SULLIVAN, M. HOWE, and F. D. SCHMALZ (Cereal Chem., 1936, **13**, 665—669).—0.4605% of glutathione (I) was found in wheat germ. H<sub>2</sub>O extract of germ, (I) from germ, and (I) from yeast had similar bad effects on the farinogram of patent flour. Oxidising agents check this action by converting the ·SH of reduced (I) into ·S·S·. Any change affecting the oxidation-reduction potential of flour will modify the gluten.

E. A. F.  
**Phosphatides in organs containing chlorophyll.** B. REWALD (Biochem. Z., 1936, **289**, 73—75).—The earlier method of prep. (A., 1929, 361) is improved. Lucerne contains a phosphatide, having a P content of 4.92%, in combination with a polysaccharide. P. W. C.

**Starch isolated from plant material by the freezing method.** H. A. SPOEHR and H. W. MILNER (J. Biol. Chem., 1936, **116**, 493—502).—The freezing method described previously (A., 1936, 124) effectively separates starch from pectin, gum arabic, and glucose, but dextrin may be carried down. The amount of dextrin in the starch-containing extracts can be determined by making use of the different solubility of the iodides of starch and dextrin in CaCl<sub>2</sub> solution, and data are given for various plant leaves. F. A. A.

**Comparative amounts of sulphur, phosphorus, and nitrogen in plants cultivated on the same soil.** G. BERTRAND and L. SILBERSTEIN (Compt. rend., 1936, **203**, 1481—1483; cf. A., 1936, 395, 650).—The S/P ratios for 13 different plants grown under the same conditions fell within the limits previously given, as did the S/N ratios. For celery collected before flowering S/P was 11.12, and if collected at the flowering stage, S/P was 7.50; the S/N ratio was 0.62. J. N. A.

**Highly polymerised natural products.** K. HESS (Angew. Chem., 1936, **49**, 841—843).—A discussion of outstanding problems relating to the structure of cellulose. F. L. U.

**Analysis of carotene.** M. PICCININI (Boll. Chim.-farm., 1936, **75**, 642, 645—646).—The pericarp of a tropical fruit yields carotene (I) and a hydrocarbon, C<sub>30</sub>H<sub>48</sub>, m.p. 180°, with 5 double linkages and probably related to 1:1':3:3'-rubene. The physiological properties of (I) and its possible relationship to vitamin-D are discussed. F. O. H.

**Resin phenols.** V. Natural phenolic substances of the "dimeric coniferyl type."—See A., I.

**Constitution of ayapanin.**—See A., II, 70.

**Constituents of bark of *Zanthoxylum americanum*.** II. Xanthyletin.—See A., II, 72.

**Alkaloid from *Equisetum palustre*.**—See A., II, 80.

**Calotropin, the African arrow poison.** I.—See A., II, 71.

**Properties of the silver electrode and titration of the total and active chlorine ion in organisms.**—See A., I, 96.

**Methods of biological assay.** J. H. BURN (Arch. exp. Path. Pharm., 1936, **184**, 37—50).—A lecture. P. W. C.

**Albumin-globulin ratios in synthetic solutions deduced from determinations of specific gravity and relative viscosity.** R. L. NUGENT and L. W. TOWLE (Proc. Soc. Exp. Biol. Med., 1935, **33**, 374—378).—In synthetic solutions the ratios can be deduced from determinations of relative  $\eta$  and  $d$  made according to the procedure described.

W. McC.

**Determination of hydroxylated acids of fats.** P. G. HAFNER, R. H. SWINNEY, and E. S. WEST (J. Biol. Chem., 1936, **116**, 691—697).—A simplification of the method of West *et al.* (A., 1934, 510) for the determination of Ac vals. of lipins and of their free insol. acids by acetylation is described. A no. of the common animal and vegetable fats contain detectable amounts of OH-acids. E. A. H. R.

**Determination of residual nitrogen in blood, plasma, serum, etc.** E. NOYONS (Chem. Weekblad, 1937, **34**, 76).—Apparatus suitable for steam-distilling NH<sub>3</sub> into standard acid in micro-Kjeldahl N determinations is described. S. C.

**Conductometric determination of chlorides in biological liquids.** S. MIHAELOFF (Bull. Soc. chim., 1936, [v], **3**, 2395—2403).—The conductometric titration with AgNO<sub>3</sub> of Cl<sup>-</sup> in normal and defibrinated blood, serum, urine, and cerebrospinal fluid gives results equal in accuracy to those given by other classical methods. The method requires only a few drops of liquid. F. L. U.

**Micro-determination of iodine in biological material.** H. WILMANN (Biochem. Z., 1936, **289**, 41—51).—Leipert's method (A., 1934, 795) is investigated and inaccuracies in Sturm's modification of it (A., 1935, 1518) are detected and surmounted. The normal blood-I is 7—15  $\times 10^{-6}\%$ . P. W. C.

**Determination of zinc in biological material.** M. SAHYUN and R. F. FELDKAMP (J. Biol. Chem., 1936, **116**, 555—562).—The volumetric ferri-cyanide procedure is applied to biological materials. The pancreas of ox, calf, sheep, and pig contain 20—40 mg. of Zn per kg. fresh wt. Commercial insulin contains 0.05—0.1 mg. of Zn per 1000 units.

F. A. A.

**Micro-determination of manganese in biological products.** P. CHERAMY and A. LEMOS (J. Pharm. Chim., 1937, [viii], **25**, 17—20).—The material is digested with HNO<sub>3</sub>-H<sub>2</sub>SO<sub>4</sub>-HClO<sub>4</sub>, treated with 10% aq. NaHSO<sub>4</sub>, filtered, and the filtrate digested with H<sub>2</sub>SO<sub>4</sub>-K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>-AgNO<sub>3</sub>, diluted, and MnO<sub>4</sub><sup>-</sup> titrated with standard H<sub>2</sub>O<sub>2</sub> solution. The Mn content of liver (calf, ox, rabbit) is 2.6—3.1  $\times 10^{-4}\%$ . F. O. H.

## A., III.—Biochemistry

MARCH, 1937.

The air bladder [of fish] and blood equilibrium: variations in volume with pressure. L. BAUDIN (Compt. rend. Soc. Biol., 1937, 124, 44—46).—Following a decrease in the pressure of the air bladder (perch), the blood pressure is reduced and CO<sub>2</sub> passes from the blood to the bladder.

H. G. R.

Variations in the blood of the perch under experimental low pressures. L. BAUDIN (Compt. rend. Soc. Biol., 1937, 124, 43—44).—An increase in the erythrocytes was observed.

H. G. R.

Methaemoglobin, a spectrophotometric study. H. F. HOLDEN (Austral. J. Exp. Biol., 1936, 14, 291—304).—The denaturation of ox methaemoglobin (I) to acid haematin (II) and the renaturation of (II) are followed spectrophotometrically. The spectrum of (II) is unaffected by combination with protective colloids. No appreciable denaturation of (I) occurs up to  $p_H$  4.1. Conversion into (II) is apparent at  $p_H$  3.9 and complete at  $p_H$  3.0. Under suitable conditions (I) can be denatured and renatured quantitatively. Renaturation of denatured oxyhaemoglobin is not quant., about two thirds only being renaturable.

E. A. H. R.

Spectra of heliocorubin and oxyheliocorubin. J. ROCHE and J. MORENA (Compt. rend. Soc. Biol., 1936, 123, 1215—1217).—The absorption spectrum of heliocorubin (I) is similar to those of the haemochromogens and has bands at 5626 and 5302 Å., whilst that of oxyheliocorubin (II), resembling those of para-haematins, has bands at 5715 and 5338 Å. A method for the spectrophotometric determination of (I) and (II) in a mixture is described.

H. G. R.

Oxidation and reduction of heliocorubin. J. ROCHE and J. MORENA (Compt. rend. Soc. Biol., 1936, 123, 1218—1220).—The reversible conversion into oxyheliocorubin occurs between  $p_H$  6 and 9, the equilibrium depending on the  $p_H$  and appearing to be due to a dissociation of a functional group of the protein constituent.

H. G. R.

Flocculation of serum-colloid mixtures in a salt-free medium. C. MOREL (Compt. rend. Soc. Biol., 1937, 124, 3—4).—The flocculation is due to loss of stability of the labile serum-proteins on reduction of the mineral content of the medium.

H. G. R.

Dilution of serum with dilute solutions of various  $p_H$ . C. ACHARD, A. BOUTARIC, and M. ROX (Compt. rend., 1936, 203, 1200—1203).—Flocculation of the globulins in horse serum on dilution with buffered Sørensen solutions becomes more pronounced as the  $p_H$  of the solutions decreases.

For all dilutions, the val. of the product  $LH$  (A., 1932, 635) decreases regularly as  $p_H$  increases from 5.3 to 7.9. There is a marked decrease in the amount of flocculation produced by dilution if the serum be previously heated for 1 hr. at 48°, whilst 1 hr. at 58° completely inhibits all subsequent flocculation.

J. N. A.

Physical property of one of the constituents of the non-dialysable fraction of blood-serum. M. DOLADILHE (Compt. rend., 1936, 203, 1295—1296).—The non-dialysable fraction of serum consists of two groups of proteins: one, thermostable, possesses dispersive properties; the other, thermolabile, has no dispersive power, but in the fresh state can sensitise a complex colloid to exhibit the dispersing action of whole serum.

J. N. A.

Effect of intravenous injection of granules of inert solids on heat production. A. LUMIERE and P. MEYER (Compt. rend. Soc. Biol., 1937, 124, 176—178).—In addition to increased blood-sugar, -protein, and -Cl, an increased temp. was observed, all of which are a function of the physical state of the granules and are accentuated by atropine and suppressed by ergotamine.

H. G. R.

Non-protein-nitrogen of blood after deproteinisation with trichloroacetic acid. P. CRISTOL and P. MONNIER (Compt. rend. Soc. Biol., 1936, 123, 1106—1107).—Deproteinisation is not complete with Goiffon and Spaey's (A., 1935, 374) or with Lefaux's (A., 1936, 356) technique, the concn. of CCl<sub>3</sub>·CO<sub>2</sub>H being insufficient.

H. G. R.

Formation of a substance similar to histamine in defibrinated and coagulated blood of the rabbit. A. SHWARTZ (Compt. rend. Soc. Biol., 1936, 123, 1181—1184).—A histamine-like substance is formed in defibrinated or coagulated blood (rabbit), probably from the platelets or leucocytes.

H. G. R.

Apparent creatinine of serum and laked blood-ultrafiltrates. O. H. GAEBLER [with L. D. ABBOTT, jun.] (J. Biol. Chem., 1937, 117, 397—413).—Picric acid and RbCl slowly ppt. from cooled ultrafiltrates of normal blood (man, dog, ox, pig) a complex containing a substance (I) similar to, but not identical with, creatinine (II). Added (II) is more rapidly pptd., and can, unlike (I), be removed from laked blood (man, dog) ultrafiltrates by kaolin. F. A. A.

Precipitation of creatinine rubidium picrate from blood-plasma filtrates. J. A. BEHRE and S. R. BENEDICT (J. Biol. Chem., 1937, 117, 415—422).—Creatinine may be determined, as the double

picrate with Rb, either in ultrafiltrates from blood plasma, or in the supernatant fluid obtained after shaking blood plasma with picric acid. Under the conditions used, creatinine, and not other creatinine-like substances, is pptd. (cf. preceding abstract).

F. A. A.

**Uric acid in the blood of insects.** M. FLORKIN (Compt. rend. Soc. Biol., 1936, 123, 1247—1249).—Vals. of 0.008—0.020% were obtained with adult insects (*Hydrophilus piceus*, *Dytiscus marginalis*, *Bombyx mori*, *Dixippus morosus*); the larvæ also give high vals., that of *B. mori* being min. 10 days after spinning.

H. G. R.

**Glutathione. I. Correlation of glutathione content of arterial and venous blood of normal rabbits. II. Effect of ultra-violet irradiation on blood-glutathione.** M. OGAWA (J. Agric. Chem. Soc. Japan, 1937, 131, 71—79, 80—88).—I. Part of the oxidised glutathione of arterial blood is represented by reduced glutathione in venous blood. Total glutathione is greater in arterial blood.

II. Irregular variations were observed for some hr. after irradiation of rabbits.

R. M. M. O.

**Determination of blood-lipins.** Y. TAKATA (J. Biochem. Japan, 1936, 24, 257—265).—Modified methods of determination (this vol., 103) give the following vals. for rabbits' whole blood and serum, respectively: total fatty acid 0.08—0.2, 0.1—0.16; total cholesterol 0.07—0.09, approx. 0.04; free cholesterol 0.04—0.05, approx. 0.02; phosphatide-P approx. 0.003, approx. 0.0015%.

F. O. H.

**Concentration of total cholesterol in serum.** W. M. SPERRY (J. Biol. Chem., 1937, 117, 391—395).—The level of serum-cholesterol (I) in man varies much more between different subjects than in the same subject at different times. Hence a single (I) determination is not diagnostically significant. In the same subject, variations observed at intervals of some months are  $\times$  those on one day.

F. A. A.

**Effect of intravenous injections of magnesium thiosulphate on blood-cholesterol.** A. LUMIÈRE and S. MONCHAL (Compt. rend. Soc. Biol., 1937, 124, 178—180).—The blood-cholesterol is increased by  $\times$  200%, the serum appearing milky.

H. G. R.

**"Bound" sugar of the blood. III. Influence of pancreatic and adrenal functions.** Y. MATSUOKA (J. Biochem. Japan, 1936, 24, 225—244; cf. A., 1936, 1400).—Administration of insulin to dogs either increases, or is without effect on, the combined sugar (I) of the blood. The effect depends on the type of diet and is influenced by starvation. Total pancreatectomy significantly increases combined (I), possibly due to inanition or weakness. Adrenaline, irrespective of the diet, does not influence combined (I). Partial adrenalectomy increases the level of combined (I) due to fasting or ingestion of (I); in the latter case, the free (I) also tends to increase.

F. O. H.

**True plasma-sugar of a selachian (*Scyllium canicula*, L.** M. FLORKIN (Bull. Acad. roy. Belg., 1936, [v], 22, 1185—1188).—The fermentable plasma-sugar is approx. 0.020% and is approx.  $\frac{2}{3}$  of the total reducing sugar (of the  $H_2WO_4$  filtrate).

F. O. H.

**Distribution of glucose in human blood and glycolysis in the preparation of protein-free filtrates by Folin's method with non-hæmolysed blood.** C. O. OLDFELT (Biochem. Z., 1936, 289, 67—72).—The ratio of the glucose contents in blood corpuscles to plasma is 0.8. During protein pptn. by Folin's method using non-hæmolysed blood, glycolysis may attain measurable proportions at room temp.

P. W. C.

**Content of true sugar in the plasma of insects.** M. FLORKIN (Compt. rend. Soc. Biol., 1936, 123, 1249—1251).—The val. for the adult insect (*Hydrophilus piceus*, *Bombyx mori*) is  $<$  that of mammals. During development of the larvæ of *B. mori*, the val., which is low at first (approx. 0.01%), rises to max. on the 5th and 10th days after spinning and then progressively diminishes.

H. G. R.

**Effect of complete isolation of the circulation on the peripheral blood-sugar.** M. POLONOVSKI, G. BIZARD, and H. WAREMBOURG (Compt. rend. Soc. Biol., 1937, 124, 75—76).—A reduction was observed in dogs.

H. G. R.

**Variations in blood-urea and -chloride after ingestion of fibrin, ovalbumin, and derived peptones.** R. LECOCQ, J. COURTOIS, and H. GARNIER (Compt. rend. Soc. Biol., 1937, 124, 106—108).—Production of urea is slight but variation in blood-Cl' is considerable after ingestion of ovalbumin (I), whilst with fibrin (II) the reverse is observed. Absorption in the intestine of (I) or (II) occurs without any considerable decomp.

H. G. R.

**Action of infra-red rays on post-operative acidosis and hypochloræmia.** O. LAMBRET, J. DRIESSENS, and H. MALATRAY (Compt. rend. Soc. Biol., 1937, 124, 62—63).—A total disappearance of acidosis and a reduction in the hypochloræmia were observed.

H. G. R.

**Condition of mineral [substances] in blood-serum. I. Ultra-filterability of calcium, magnesium, and inorganic phosphate in bovine blood serum in relation to hydrogen-ion concentration.** L. SEEKLES (Arch. Neerland. Physiol., 1936, 21, 526—537).—Changing the  $p_H$  of bovine blood serum from the normal val. (7.4) to 7.0 increases the ultrafilterable fraction of the Ca by 7% of the total Ca; changing the  $p_H$  to 8.0 lowers this fraction by about 2% of the total Ca. Greater changes take place with wider variations in  $p_H$ , all Ca being diffusible at  $p_H < 4.1$ . Mg shows similar but smaller effects, no definite change taking place over the physiological range 7.0—8.0.  $PO_4'''$  is completely diffusible at  $p_H < 9$ ; at  $> 9$  pptn. occurs. These findings are discussed in relation to the Ca content of sera in various pathological conditions.

F. A. A.

**Inorganic composition of blood. IV. Relationship between potassium and the acid-soluble phosphorus fractions.** S. E. KERR (J. Biol. Chem., 1937, 117, 227—235).—In the erythrocytes of vertebrates (except the dog), low and high K contents are associated with low and high acid-sol. org. P contents, respectively. The composition of the erythrocytes varies greatly amongst the species and

amongst races of the same species. Sheep on the same diet exhibit great differences in blood-K and -Na.

W. McC.

**Blood-inorganic phosphates in carbohydrate metabolism.** M. PLJOAN and T. B. QUIGLEY (Proc. Soc. Exp. Biol. Med., 1936, 35, 131—134).—The depression of blood-inorg. P (I) which occurs on glycogenesis is increased by starvation, but is unaffected by adrenalectomy, or by injection of insulin after adrenalectomy. Glycogenolysis also depresses (I).

P. G. M.

**Determination of calcium in blood serum.** H. K. MURER (Ind. Eng. Chem. [Anal.], 1937, 9, 27).—The  $\text{CaC}_2\text{O}_4$  ppt. is separated and washed in a sintered-glass Büchner funnel instead of by decanting and centrifuging.

E. S. H.

**Relation of copper and iron in blood.** Polycythæmia vera. A. SACHS, V. E. LEVINE, and W. O. GRIFFITH (Proc. Soc. Exp. Biol. Med., 1936, 35, 6—10).—Treatment of polycythæmia vera with  $\text{NHPh}\cdot\text{NH}_2$  lowers the Fe and red-cell count and increases blood-Cu. The body compensates for hypoferronæmia by an increase in the more active oxidation catalyst, Cu.

P. G. M.

**Modification of the internal medium of *Helix* during hibernation and estivation.** P. MEYER and M. A. THIBAUDET (Compt. rend. Soc. Biol., 1937, 124, 185—187).—The essential factor is a loss of  $\text{H}_2\text{O}$ .

H. G. R.

**Restoration of circulatory blood after hæmorrhage.** I. Changes in the hæmoglobin content of the blood and in the colloid-osmotic pressure of the plasma of rabbits after bleeding. II. Restoration of colloid-osmotic pressure of plasma after bleeding. III. Changes in blood volume and colloid-osmotic pressure of plasma following replacement by various solutions of the blood withdrawn. H. NAGAOKA (Japan J. Med. Sci., 1935, III, 3, 395—425; 1936, III, 4, 15—41, 199—211).

E. A. H. R.

**Coagulation of blood by proteolytic enzymes (trypsin, papain).** H. EAGLE and T. HARRIS (Proc. Soc. Exp. Biol. Med., 1936, 35, 157—158).—It is suggested that Ca and platelets together contain a proteolytic enzyme which, like trypsin, converts prothrombin into thrombin, and that the latter is an enzyme which, like papain, converts fibrinogen into fibrin.

P. G. M.

**Action of enzymes on antibodies.** A. H. ROSENHEIM (Biochem. J., 1937, 31, 54—71).—The O agglutinins from the sera of horses immunised with *B. typhosus* are rapidly destroyed by pepsin (I), trypsin (II), and activated papain (III), which also destroy the H agglutinins from horses once immunised, but not those from horses several times immunised. H agglutinins apparently resistant to (I) and (II) are not so to activated (III). The globulin fractions of sera obtained after immunisation are hydrolysed to approx. the same extent by (I), (II), and (III). In these fractions peptic digestion resulting in increase of  $\text{NH}_2\cdot\text{N}$  < 5% of total N destroys H and O agglutinins. When the increase is 17% there is no destruction of H agglutinins after repeated immunis-

ation and when, after tryptic digestion, the increase is 36% there is < 50% destruction. Dipeptidase at  $p_{\text{H}}$  7.8 and aminopolypeptidase at  $p_{\text{H}}$  7.0 do not destroy the agglutinins after one immunisation.

W. McC.

**Influence of alexine on the dispersion of a colloidal complex by blood-serum.** M. DOLADILHE and C. MOREL (Compt. rend., 1936, 203, 1102—1104).—The opacity of the flocculate obtained by the action of syphilitic serum on suitable colloidal suspensions prepared from organ extracts decreases when incubated with serum containing complement (I) but not with serum deprived of (I). Ppts. obtained by the interaction of antibody with antigen are also cleared by serum containing (I). The adsorption of (I) by the antigen-antibody complex renders the latter more sensitive to the dispersive action of the serum.

W. O. K.

**Antigen of the Wassermann reaction.** I. SAKAKIBARA (J. Biochem. Japan, 1936, 24, 31—72).—An antigen prep. of EtOH extract of ox heart with 10% of its vol. of 1% cholesterol (I) in EtOH contained 0.324% of lecithin (II), 0.108% of cephalin (III), 0.173% of (I), and  $\text{H}_2\text{O}$ - and  $\text{COMe}_2$ -sol. substances; of these constituents (II) [especially the optically inactive  $\beta$ -(II)] is antigenic against syphilitic serum. Preps. of (II) from ox heart, liver, and kidney are active whilst those from spleen and brain are practically inactive;  $\beta$ -(II) [the highest content of which is in heart-(II)] from such preps. is always active. The antigenic activity of ox heart-(II) [or  $\beta$ -(II)] is decreased by addition of ox brain-(III) [or  $\beta$ -(III)] and increased by (I). The activity of  $\beta$ -(II) is confirmed by its use in the Sachs and Georgi reaction.

F. O. H.

**Combination between antigen and precipitating antibody.** F. HAUROWITZ [with F. KRAUS and F. MARX] (Z. physiol. Chem., 1936, 245, 23—40).—The results (production of antibodies, specificity) of injection into rabbits of antigens obtained by coupling serum-globulin (horse) with various amounts of diazotised atoxyl indicate that the antibodies are globulins of const. composition and that they are sp. for determinate groups in the antigens and not for the antigens as wholes. The presence of the lipins of the antigens and of the immune sera is not necessary for pptn. of As-containing globulins. Combination of antigen with antibody results probably from the interaction of ionic or polar groups, electrostatic or induced forces, acting at short distances only, being involved.

W. McC.

**Antigens of venins and antibodies of venom sera.** IV. Action of a bivalent antivenin serum (*Bitis arietans* + *Sepedon hæmachates*) on the two homologous and various heterologous venins. E. CÉSARI and P. BOQUET (Ann. Inst. Pasteur, 1937, 58, 6—25).—The mixed antisera produced by *B. arietans* and *S. hæmachates* (which produce lyso-lecithins) are very active towards the venins of *Naja flava* and *S. hæmachates*, but only feebly so towards those of *B. arietans*, *Crotalus terrificus*, and *Bothrops atrox*. No co-ordination exists between the antitoxic and antidiastatic properties of antivenin sera produced by the venins of different species of snake.

P. G. M.

**Serological reactions of euglobulins.** V. CHORINE (Ann. Inst. Pasteur, 1937, 58, 78—124).—Henry's reaction for malaria does not depend on the presence in the serum of an antibody; the rôle of melanin is merely that of an indicator in the reaction, and it can be replaced by carmine etc. The flocculation of the serum observed in distilled  $H_2O$  or hypotonic solutions is due to an increase in the euglobulins and lipin complexes. Pseudoglobulins diminish the intensity of the reaction of a positive serum. The clinical val. of the reaction is discussed. EtOH and MeOH ppt. kala-azar sera in smaller concn. than is required for normal sera. The properties of different euglobulin fractions depend on the lipin complexes with which they are associated; these fractions all exist in normal sera but in different proportions from those in pathological sera.

P. G. M.

**Rapid process of agglutination after centrifuging.** A. BECKERICH (Compt. rend. Soc. Biol., 1936, 123, 1193—1194).—A claim for priority (cf. Le Guyon, A., 1936, 1531).

H. G. R.

**Testing of therapeutic sera. II. Testing of various sera by neutralisation of the antibody *in vitro*.** L. COTONI and J. POCHON (Ann. Inst. Pasteur, 1936, 57, 695—703; cf. A., 1936, 1402).—The application of the authors' method (A., 1936, 748) to anti-bacterial sera is described.

A. L.

**Purification of diphtheria, tetanus, and staphylococcus toxins and anatoxins by means of trichloroacetic acid.** A. BOIVIN and Y. IZARD (Compt. rend. Soc. Biol., 1937, 124, 25—28).—Following pptn. at  $p_H$  3.5, the toxin is eluted with 0.01N- $Na_2CO_3$  and the anatoxin with  $PO_4'''$  buffer at  $p_H$  8.0.

H. G. R.

**Flocculating and immunising properties of diphtheria anatoxin purified by trichloroacetic acid.** G. RAMON, A. BOIVIN, and R. RICHOU (Compt. rend. Soc. Biol., 1937, 124, 28—32).—These are similar to those of the anatoxic bouillon.

H. G. R.

**Antigenic power *in vitro* and *in vivo* of tetanus anatoxin purified by trichloroacetic acid.** G. RAMON, A. BOIVIN, and R. RICHOU (Compt. rend. Soc. Biol., 1937, 124, 32—35).—Very little of the antigenic power is lost during the purification.

H. G. R.

**Purification of tetanus toxin.** M. D. EATON (Proc. Soc. Exp. Biol. Med., 1936, 35, 16—19).—The process, which involves pptn. with  $Fe^{III} NH_4$  alum, elution with Na citrate, pptn. with  $CdCl_2$ , and emulsification with aq. NaCl, removes 99% of nitrogenous impurities; the org. residue contains 12% of N and has a min. lethal dose of 0.00015—0.0003 mg. per kg. in the guinea-pig.

P. G. M.

**Anastaphylotoxin purified by means of trichloroacetic acid and the production of the antitoxin in the animal.** G. RAMON, A. BOIVIN, and R. RICHOU (Compt. rend. Soc. Biol., 1937, 124, 88—90).—No difference was observed between the utilisation of the crude or the purified anatoxin by the animal.

H. G. R.

**Immunising action of the staphylococcus anatoxin, purified by trichloroacetic acid, in preventive doses in man.** G. RAMON, C. GERNEZ, A. BOIVIN, and R. RICHOU (Compt. rend. Soc. Biol., 1937, 124, 90—93).—The immunising action of the purified is slightly > that of the crude material.

H. G. R.

**Immunising and therapeutic properties of staphylococcus anatoxin purified by trichloroacetic acid in staphylococcus infections.** G. RAMON, A. BOIVIN, P. MERCIER, and R. RICHOU (Compt. rend. Soc. Biol., 1937, 124, 93—96).—The purified anatoxin is of considerable therapeutic val. in staphylococcal infections.

H. G. R.

**Standardisation of typhoid and paratyphoid vaccines. I. The Gates apparatus and total nitrogen determinations.** R. F. FEEMSTER, L. H. WETTERLOW, and J. CIANCARULO (Amer. J. Publ. Health, 1936, 26, 1176—1184).—A modification of the Gates apparatus (described) affords as accurate a method of standardisation as direct counts. A total N of 22.5 mg. is equiv. to  $10^9$  typhoid bacilli.

E. A. H. R.

**Purification of tuberculin.** A. BOQUET and G. SANDOR (Ann. Inst. Pasteur, 1936, 57, 622—630).—Addition of acidified MeOH to the filtrate containing tuberculin prepared as described (A., 1936, 385) ppts. 25% of the total solids. The ppt. contains all the activity and may be preserved as a non-hygroscopic powder sol. in 0.01N- $NaOH$ .

A. L.

**Type-specific antipneumococcal rabbit serum.** F. L. HORSFALL, jun., K. GOODNER, and C. M. MACLEOD (Science, 1936, 84, 579—581).—Immune rabbit sera confer a greater degree of protection on mice in proportion to the content of specifically precipitable protein than do antipneumococcal horse sera.

L. S. T.

[Carbonate content of inorganic bone material and its synthesis.] T. GASSMANN (Ber., 1937, 70, [B], 41—42; cf. Klement, A., 1936, 1533).—The ratio  $CaO : PO_4 : CO_3 = 10 : 6 : 1$  in bones and teeth agrees with the presence of carbonate-apatite but not with hydroxyapatite  $Ca_{10}(PO_4)_6(OH)_2 \cdot CaCO_3$ . Free  $CaCO_3$  is not present in bones.

H. W.

**Colorimetric micro-determination of copper in human liver by means of cryogenin.** K. HINSBERG and H. GÖCKEL (Biochem. Z., 1936, 289, 57—66).—A method is given for the prep. of cryogenin from  $m\text{-NO}_2 \cdot C_6H_4 \cdot CO_2H$  through  $m\text{-NH}_2 \cdot C_6H_4 \cdot CO \cdot NH_2$  and for the determination by its use of  $0.5\text{--}2.75 \times 10^{-6}$  g. of Cu by a colorimetric modification of Sarata's method (A., 1934, 202, 1123). The Cu contents of diabetic and normal liver are the same.

P. W. C.

**Magnetic anisotropy of naturally occurring substances. II. Molluscan shells.** P. NILAKANTAN (Proc. Indian Acad. Sci., 1936, 4, A, 542—550; cf. A., 1936, 277).—The cryst. character of a no. of shells is inferred from determinations of magnetic anisotropy, and the probable orientations have been deduced.

R. S.

**$p_H$  and the buffering power of rat's muscle.** I. I. NITZESCU and I. D. GEORGESCU (Compt. rend.

Soc. Biol., 1937, 124, 154—155).—The  $p_H$  of rat's muscle is 7.2—7.3. H. G. R.

[Cell] diffusion factors. F. DURAN-REYNALD (Ann. Inst. Pasteur, 1936, 57, 597—621).—A review. A. L.

Exchange of salt and water between muscle and blood. I. Effect of an increase in total body-water produced by intravenous injection of isotonic salt solutions. A. B. HASTINGS and L. EICHELBERGER (J. Biol. Chem., 1937, 117, 73—93).—A method for the study of shifts of  $H_2O$  and salts between muscle and blood in the living dog is described and average normal vals. for Na, Cl,  $H_2O$ , K, and total base in serum and skeletal muscle are recorded. The total  $H_2O$  content of fat-free skeletal muscle is 76.5% and of the intracellular muscle 71.7%. The data indicate that the extracellular muscle forms 17% of the total muscle-tissue. Relative changes in extra- and intra-cellular muscle on rapid injection of normal, alkaline, or acid isotonic aq. NaCl are described. P. W. C.

Water and fat contents of tsetse flies. R. W. JACK (Nature, 1937, 139, 31).—Changes in fat content must be taken into account in determining variations in  $H_2O$  balance. L. S. T.

Nitrogenous bases of the extract of dog's muscle. A. N. PARSCHIN (Z. physiol. Chem., 1936, 245, 41—46; cf. Wolff and Wilson, A., 1935, 882).—The muscle (11 kg.), on extraction with  $H_2O$  at 50—60°, deproteinisation, and fractional pptn. with  $HgSO_4$ ,  $AgNO_3$ ,  $Ba(OH)_2$ , and  $KBiI_4$ , yielded carnosine (30 g.), anserine (7.3 g.), methylguanidine, creatinine, creatine, and carnitine. W. McC.

Cystine content of hair and feathers. Y. OKUDA and K. KATAI (J. Biochem. Japan, 1936, 24, 207—214).—The cystine contents of the hair and feathers of various animals are tabulated. Generally the content increases with age and is higher in the female than in the male. With the hair of horse's mane and tail, the content of the terminal part is > that of the other parts; with feathers, that of the barbs is > that of the rachis. F. O. H.

Histamine formation from histidine through ascorbic acid.—See A., II, 117.

Changes in total nitrogen and lipin contents of the brain of oxen with age. I. A. SMORODINCEV and K. V. BEBESCHIN (J. Biochem. Japan, 1936, 24, 245—255).—Data for lipin (I), dry residue, and protein (II) contents of cerebrum, cerebellum, and medulla oblongata of oxen aged 1—13 years are tabulated. The greatest changes occur during the first 4 years. In the grey and, during the first year, white matter of the cerebrum, the increase in (II) is respectively > and < that in (I). The ratio (I)/(II) for the grey matter of the cerebrum equals that for the cerebellum. F. O. H.

Lipins of tooth pulp. H. C. HODGE (Proc. Soc. Exp. Biol. Med., 1936, 35, 53).—Total lipins (I) were 0.91, phospholipins 0.70, and cholesterol 0.11% for human tooth pulp. The (I) of cow tooth pulp (0.85%) contained 50% of unsaponifiable matter; the saponifiable fraction contained 76.6% of fatty acids (I val. 72.3). P. G. M.

Determination of small amounts of lipins in animal organs. J. ACKERMANN (Bull. Acad. Polonaise, 1936, B, 167—176).—Discrepancies in the vals. obtained for free (I) and total (II) cholesterol in extracts from frog gut [(I)>(II), in some cases] suggest that the extracts contain a substance sensitive to saponification. Purified lecithin from egg-yolks may be kept in vac. in the dark for 5 days without significant decomp.; after 10 days, 2% of decomp. products are present. F. A. A.

Artificial "lipo-proteins." S. J. VON PRZYŁECKI and E. HOFER (Biochem. Z., 1936, 288, 303—309).—The formation of a ppt. of "lipo-protein" from aq. albumin with lecithin (I) or oleic acid (II) following change in  $p_H$  or addition of  $(NH_4)_2SO_4$  is independent of  $p_H$  or proportion of components initially present. EtOH separates only a part of the (II) from (II)-protein, whilst with EtOH +  $Et_2O$ , the separation is complete with (II)—but only partial with (I)—protein. The nature of lipin-protein complexes is discussed. F. O. H.

Galactin content of the rat pituitary. R. P. REECE and C. W. TURNER (Proc. Soc. Exp. Biol. Med., 1936, 35, 60—62).—The immature female pituitary contains three times the amount of galactin (I) present in the immature male gland. The size of the pituitary and the concn. of (I) increase as the animal matures. Injection of Oestroform B increases the wt. of the male pituitary and the total (I) content. 48 hr. postpartum the (I) content of the pituitary is double that of the glands of the normal oestrus female or the 21-day pregnant animal. P. G. M.

Further purification of Dakin and West's liver fraction. Purified anahæmin compared with the original product in regard to effect in pernicious anæmia. C. C. UNGLEY (Lancet, 1936, 83, 1513—1518).—Treatment of the glucosamine-free peptide (this vol., 8) by Laland and Klem's process (A., 1936, 1534) gives a product which is  $2\frac{1}{2}$  times as potent as the original anahæmin. L. S. T.

Biochemistry of carbohydrates. XVI. Vitellomucoid. XVII. Mucoid of egg-white and -yolk during development of the chick. T. INOE. XVIII. Carbohydrate complex of serum-mucoid. G. OZAKI (J. Biochem. Japan, 1936, 24, 1—8, 9—20, 73—79).—XVI. Egg-yolk, freed from lipins by  $Et_2O$ -EtOH, on (a), dialysis, separation of vitellin and livetin from the dialysate by centrifuging and half-saturating with  $(NH_4)_2SO_4$ , respectively, and concn. and pptn. of the residue with EtOH or (b), refluxing with 95% EtOH acidified to  $p_H$  5 with AcOH and treating the extract with EtOH, affords "vitellomucoid,"  $[\alpha]^{25}_D$  —24.7°, S 2.39—2.85%, isoelectric point approx.  $p_H$  5.5, containing protein, mannose (20.2%), and glucosamine (10.1%).

XVII. Absorption of mucoid (I) by the chick embryo (which is probably direct and not *via* the yolk) from the white is > that of other proteins. The yolk-(I) is not absorbed preferentially to other proteins. White-(I) temporarily increases between the 6th and 12th days. Absorption of (I) is preceded by fission of protein but not carbohydrate groups.

XVIII. The carbohydrate of serum-(I) is a (prob-

ably multiple) complex of mannose (2 mols.) and acetylglucosamine (1 mol.). F. O. H.

**Calcium-binding power of ovalbumin.** J. C. ABELS (J. Amer. Chem. Soc., 1936, 58, 2609—2610).—The Ca-binding power, determined by Loeb's method (A., 1926, 856), of ovalbumin (I) is < that of deaminised (I), whilst that of acetylated (I) is approx. nil. Deacetylation (alkali) of acetylated (I) restores the binding power which appears to occur through  $\cdot\text{OH}$ . The  $\cdot\text{OH}$  is not necessarily phenolic since gelatin combines with Ca to the same extent as (I). H. B.

**Transformation temperature of elastoidin.**—See A., I., 134.

**Behaviour of the electrical conductivity of ovalbumin with change in temperature.**—See A., I., 134.

**Collagen.**—See B., 1937, 69.

**Overbreathing tetany. Changes in the calcium of serum, serum-ultrafiltrates, and cerebrospinal fluid.** R. A. McCANCE and E. WATCHORN (Lancet, 1937, 232, 200—201).—Spontaneous overbreathing in women, sufficient to cause severe tetany, brings about a rise in serum-Ca, a small rise in the ultrafilterable Ca, but no change in the cerebrospinal fluid-Ca or  $\cdot\text{P}$ . L. S. T.

**Cerebrospinal fluid in spontaneous overbreathing tetany.** J. N. CUMINGS and E. A. CARMICHAEL (Lancet, 1937, 232, 201—202).—In two cases there was a small decrease in serum-Ca, but practically none in cerebrospinal fluid-Ca. L. S. T.

**Content and variation of salinity and alkalinity of the water contained in the cavity of *Codium bursa*, L.** R. LAMI (Compt. rend., 1936, 203, 1093—1095).—The aq. NaCl in the cavities of *C. bursa* tends to attain a state of diffusion equilibrium with the sea- $\text{H}_2\text{O}$  in which it is immersed but this is not complete even after 7—8 hr. The  $p_{\text{H}}$  of the cavity fluid varies from 7.8 to 8.1, being always < that of the sea- $\text{H}_2\text{O}$  (up to 8.8). W. O. K.

**Decrease in the lactose content of milk following the production of artificial hypoglycæmia.** W. R. BROWN, W. E. PETERSEN, and R. A. GORTNER (J. Dairy Sci., 1936, 19, 147—154).—Insulin hypoglycæmia reduces the lactose content of milk. In several cases the general trend of blood- and milk-sugar curves was similar. When blood was markedly depleted of sugar insulin injection caused an increase in blood-sugar. Increased lactose in milk at the evening milking period was not preceded by an increase in blood-sugar. A. G. P.

**Role of the bile in growth.** G. BALTECEANO and C. VASILIU (Compt. rend. Soc. Biol., 1937, 124, 157—160). Young animals with biliary fistulæ show signs of inanition similar to those occurring during avitaminosis. H. G. R.

**Combined cholesterol in human bile.** C. RIEGEL, I. S. RAVDIN, and H. J. ROSE (Proc. Soc. Exp. Biol. Med., 1936, 35, 94—97).—Cholesterol is rarely present in esterified form in bile from fistula except when the bile is contaminated with blood. P. G. M.

**Hydrogen-ion concentration of guinea-pig bile.** J. C. KRANTZ, jun., M. FELDMAN, S. MORRISON, and C. J. CARR (Proc. Soc. Exp. Biol. Med., 1936, 35, 48—49).—The mean  $p_{\text{H}}$  is 8.89 at 25°. The bile contains total solids 2.16, ash 0.10, mucin 0.51, total lipins 0.14, and bile acids (cholic and deoxycholic) 0.78%. The constituents closely resemble those of human bile but the  $p_{\text{H}}$  is higher. P. G. M.

**Synthesis of octamethylbilirubin.**—See A., II, 122.

**Bromine in gastric juice.** C. CHATAGNON (Compt. rend., 1936, 203, 1293—1294).—In 18 females ages 18 to 72, the amount of Br varied from 0.087 to 2.57 mg. per litre. J. N. A.

**Gland secretion of alligators (yacarol). II.** G. FESTER, F. A. BERTUZZI, and D. PUCCI (Ber., 1937, 70, [B], 37—41; cf. A., 1934, 509; 1936, 1229).—The oil (I) obtained by expression of the glands deposits palmitic acid (II). Further expression of the glands after addition of EtOH followed by Et<sub>2</sub>O gives a cryst. material, m.p. about 80°, which is hydrolysed to (II) and gives a sterol, apparently cholesterol with a difficulty separable companion. Treatment of (I) with HCl removes a small amount of volatile bases. Treatment of (I) as described previously (*loc. cit.*) followed by very careful fractional distillation shows that "yacarol" consists mainly of *d*-citronellol; oxidation of the latter affords lævulic and  $\beta$ -methyladipic acid. The more volatile portion of the distillate appears to contain an unidentified, saturated alcohol, C<sub>8</sub>H<sub>17</sub>·OH. H. W.

**Diazo-reaction of albumin and its utilisation in urology.** E. JUSTIN-MUELLER (J. Pharm. Chim., 1937, [viii], 25, 62—69).—Addition of NaNO<sub>2</sub> and  $\beta$ -C<sub>10</sub>H<sub>7</sub>·ONa followed by HCl to urine containing albumin produces a cherry-red coloration, particularly noticeable in the froth. The reaction is not sp. J. N. A.

**Determination of urinary hydroxyproteic acids and its diagnostic importance.** B. LUSTIG and K. TUCHLER (Biochem. Z., 1936, 289, 143—154).—A method suitable for clinical use is described for determining urinary hydroxyproteic acids as a % of urinary total N, and is used with urines of healthy and pathological subjects. High vals. were obtained only in cases of tuberculosis, bile disorders, and in certain malignant tumours. Some properties of a very crude prep. are described. P. W. C.

**Colour of urine in diagnosis.** J. GUTSCHMIDT (Pharm. Ztg., 1937, 82, 61—62).—The presence of some therapeutic substances or their metabolic products is indicated by the original colour of the urine and that after addition of acid, alkali, aq. NH<sub>3</sub>, FeCl<sub>3</sub>, Br or Cl<sub>2</sub>, or H<sub>2</sub>SO<sub>4</sub>, or after extraction with amyl alcohol. F. O. H.

**Sterols of silkworm fæces.** W. BERGMANN (J. Biol. Chem., 1937, 117, 175—178).—The unsaponifiable fraction of the Et<sub>2</sub>O extract of the dried fæces of *Bombyx mori* yields cholesterol and an impure sterol, m.p. 129—130°,  $[\alpha]_{\text{D}}^{25}$  —33.51° in CHCl<sub>3</sub>, which is probably sitosterol containing 9—13% of saturated sterols. W. McC.

**Nutritional anaemia in rats alleviated by evaporated milk and iron.** H. B. STEIN, M. H. RADETSKY, and R. C. LEWIS (J. Dairy Sci., 1936, 19, 117—124).—Evaporated milk supplemented with  $\text{FeCl}_3$  cured anaemia produced by feeding raw milk. The effect is ascribed to Cu present in the evaporated milk. A. G. P.

**Pernicious anaemia after nitric acid corrosion of the stomach.** G. ALSTED (Lancet, 1937, 232, 76—79).—A case report. L. S. T.

**Content of amino-acids, polypeptides, non-protein-nitrogen, albumins, globulins, and fibrinogen in cancerous blood.** R. REDING (Compt. rend. Soc. Biol., 1936, 123, 1238—1240).—In cancerous blood  $\text{NH}_2$ -acids, polypeptide, and fibrinogen increase. A diminution in the albumin and an increase in the globulin were accompanied by little change in the non-protein-N. H. G. R.

**1:2-Benzanthrene derivatives.**—See A., II, 93.

**Fatty oil, especially the cholesterol ester, of rat sarcoma.** A. ICHIBA and E. SOMEKAWA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1936, 30, 278—283).—Most work on the constituents of tumours is vitiated by contamination of the starting material. The oil (const. detailed) from living rat sarcoma contains cholesteryl palmitate, m.p.  $79^\circ$ , cholesterol (I), a solid alcohol, and liquid esters and unsaponifiable matter. Hydrolysis gives 44.3% of liquid and 55.62% of solid acids, including stearic acid and an acid, m.p.  $40^\circ$ . 50% of the (I) occurs as esters. R. S. C.

**Naphthalene cataract of the lens of the eye.** M. MORIYAMA (J. Biochem. Japan, 1936, 24, 81—105).—Ingestion of  $\text{C}_{10}\text{H}_8$  or its derivatives by rabbits increases excretion of ethereal  $\text{SO}_4^{''}$ ; with  $\text{C}_{10}\text{H}_8$ , PhI, and  $\text{C}_{10}\text{H}_7\cdot\text{OH}$ , but not  $\beta\text{-C}_{10}\text{H}_7\cdot\text{NH}_2$  or  $2\text{-C}_{10}\text{H}_7\text{Br}$ , the urinary inorg.  $\text{SO}_4$  diminishes. The excretion of neutral S is greater with  $\text{C}_{10}\text{H}_8$  than with its derivatives but an increased excretion of glycuronate occurs only with its derivatives. The above phenomena are unaffected by simultaneous injection of insulin or adrenaline. Ingestion of  $\text{C}_{10}\text{H}_8$  does not affect the ascorbic acid content of the organs including, up to the time of incidence of cataract, the lens (cf. Euler and Martius, A., 1934, 96). The binding capacity of the cataract lens for NaCl, KCl,  $\text{CaCl}_2$ , and glucose is  $>$ , and for HCl  $<$ , the normal vals. F. O. H.

**Arbutin diabetes.** F. Y. MICHEL (Proc. Soc. Exp. Biol. Med., 1936, 35, 62—64).—Subcutaneous injection of sterile aq. arbutin (I) in fasting dogs produces a diabetes similar to that produced by phloridzin. The ratio glucose : N in the urine averaged 1.61 in 4 dogs. (I) inhibits glycolysis in brain and in striated and cardiac muscle. P. G. M.

**Cardiac glycogen in diabetic animals.** G. EVANS and M. A. BOWIE (Proc. Soc. Exp. Biol. Med., 1936, 35, 68—71).—Cardiac glycogen, which is raised in depancreatised cats and maintained in phloridzinised fasting cats, is unaffected by injection of adrenaline. P. G. M.

G\* (A., III.)

**Effect of human diabetic blood on the blood-sugar of the normal dog.** F. RATHERY, D. BARGETON, and P. M. DE TRAVERSE (Compt. rend. Soc. Biol., 1936, 123, 1108—1110).—Injection of diabetic blood produces in some cases a slight hyperglycaemia. H. G. R.

**Gonadotropic hormone of the anterior pituitary lobe in cerebral tumours and encephalic diseases.** M. MONNIER (Compt. rend. Soc. Biol., 1936, 123, 1116—1118).—In cases of cerebral tumour, the presence of the gonadotropic hormone can be demonstrated in the body-fluids. H. G. R.

**Drugs useful in the treatment of gas victims.** A. KEILHOLZ (Pharm. Weekblad, 1937, 74, 46—60, 70—83).—A full account is given of the therapy and methods of treating victims of gas attacks, including incendiary air raids. S. C.

**Relation between iodine and the composition of the diet [and goitre].** J. A. F. VAN DEN BELT (Arch. Néerland. Physiol., 1936, 21, 599—603).—The wts. of the thyroid glands of rats maintained on various diets show that the occurrence of the goitrous condition depends not only on deficiency of I, but also on other constituents of the diet. F. A. A.

**Blood-electrolytes in experimental liver injury by arsphenamine in dogs.** J. L. SOFFER (Proc. Soc. Exp. Biol. Med., 1936, 35, 160—163).—Jaundice was produced in dogs by one or more injections of 40—80 mg. per kg. of arsphenamine, and 6—8 hr. after its appearance the animals died. At necropsy the kidneys were grossly normal, but the livers were affected. Blood-bilirubin was 2—16 mg. per 100 c.c. and the reduction of plasma vol. was 13.8—32.0%. Blood- $\text{CO}_2$  was reduced by 22—50%; Na and Ca remained const., but inorg. P was increased  $1\frac{1}{2}$ —4 fold. Non-protein-N and urea were increased in all, and hypoglycaemia developed in 4 out of 6 cases. P. G. M.

**Experimental hepatic insufficiency. Ammonia and amino-acids in the urine during toxic hepatitis in guinea-pigs.** F. MEERSSEMAN, J. DORCHE, E. JOET, and P. DURON (Compt. rend. Soc. Biol., 1937, 124, 180—182).—The increase in the urine of N titratable by  $\text{CH}_2\text{O}$  is due mainly to  $\text{NH}_2$ -acids. H. G. R.

**Blood-protein equilibrium in malaria and anaphylactic shock.** THIODET and RIBERE (Compt. rend. Soc. Biol., 1937, 124, 57—60).—The changes in blood equilibrium during malaria are very similar to those observed in anaphylactic shock. H. G. R.

**Choline-esterase activity of serum in two cases of myasthenia gravis.** C. S. HICKS and M. E. MacKAY (Austral. J. Exp. Biol., 1936, 14, 275—289).—Choline-esterase activity increases in the serum of the myasthenic patient. E. A. H. R.

**Choline-esterase activity in disease with special reference to myasthenia gravis.** M. McGEORGE (Lancet, 1937, 232, 69—72).—Determinations of the widely-varying esterase (I) activity of the sera of 132 patients revealed no correlation with type of disease or other factors. After administration of prostigmine there is a sudden fall in serum-(I) activity due to inhibition and not to destruction of (I). Myasthenia

gravis is associated with a failure in equilibrium between the rate of liberation of acetylcholine at the motor end-plates and the rate of its destruction by the (I) locally present. L. S. T.

**Blood-cholesterol in nephritis in dogs.** E. DARRASPEN and R. FLORIO (Compt. rend. Soc. Biol., 1937, 124, 115—117).—Hypercholesterolemia together with increased blood-urea and -Cl<sup>-</sup> were observed. Before the disease proved fatal, hypocholesterolemia, a decrease in the alkaline reserve, and an increase in blood-N and -Cl<sup>-</sup> occurred.

H. G. R.

**Treatment of glomerulonephritis by antigen.** H. B. DAY (Lancet, 1936, 231, 1456—1459).—A substance possessing an antigenic effect is present in the urine in acute and subacute glomerulonephritis.

L. S. T.

**Simultaneous excretion of coproporphyrin I and III in chronic porphyria.** K. DOBRINER (Proc. Soc. Exp. Biol. Med., 1936, 35, 175—176; cf. A., 1936, 503).—Coproporphyrins I [Me ester, m.p. 238—239° (lit. 252°)] and III were isolated from the faeces of a patient with chronic porphyria.

P. G. M.

**Carotene therapy of retinitis pigmentosa.** E. M. JOSEPHSON and M. FREIBERGER (Nature, 1937, 139, 155).—Intramuscular, but not oral, administration of carotene produces rapid relief of the early stages of retinitis pigmentosa, in which there is probably a failure of assimilation of vitamin-A and its precursors.

L. S. T.

**Calcium and phosphorus requirements of rachitic rats.** R. NICOLAYSEN (Biochem. J., 1937, 31, 105—106).—The amounts of Ca and P absorbed by rats and their daily requirement are discussed and the calc. vals. of Karelitz and Shohl (A., 1927, 790) are criticised.

P. W. C.

**Assimilation of the Steenbock-Black diet in normal and vitamin-D-deficient rats with and without caecum.** J. R. M. INNES and R. NICOLAYSEN (Biochem. J., 1937, 31, 101—104).—The absorption of Ca and P from this diet is unaffected by extirpation of the caecum, the only effect being a slightly decreased utilisation of the diet. The slow rate of passage of the intestinal contents through the caecum does not play any role in the smaller susceptibility to rickets.

P. W. C.

**Lead content of spinal fluid with reference to multiple sclerosis.** P. H. GARVEY and F. V. ROCKWELL (Proc. Soc. Exp. Biol. Med., 1936, 35, 201—203).—Pb is not present in the spinal fluid of patients with multiple sclerosis.

P. G. M.

**Glutathione in the tissues of the guinea-pig during experimental ictero-haemorrhagic spirochaetosis.** L. BINET and G. WELLER (Compt. rend. Soc. Biol., 1937, 124, 11—12).—An increase in both the reduced and oxidised forms was observed.

H. G. R.

**Chemical processes during contraction of muscle.** K. LOHMANN (Angew. Chem., 1937, 50, 97—100).—A review.

F. O. H.

**Effect of low oxygen tension on respiration and fermentation of isolated cells.** W. KEMPNER

(Proc. Soc. Exp. Biol. Med., 1936, 35, 148—151).—O<sub>2</sub> tensions of 1—20 vol.-% do not affect respiration of erythrocytes or bacteria at low temp. nor of old bacterial cultures at 25—42°, whilst tensions of 0—5 vol.-% markedly decrease respiration of both young plant and young animal cells. In absence of O<sub>2</sub> lactic acid is formed by goose erythrocytes, but at an O<sub>2</sub> tension of 3.4 vol.-% none is formed in spite of a 60% decrease in respiration. Respiration is not related to glycolysis.

P. G. M.

**Effect of cysteine on the metabolism of isolated brain tissue.** W. GOLDFARB, J. F. FAZEKAS, and H. E. HIMWICH (Proc. Soc. Exp. Biol. Med., 1936, 35, 31—32).—The initial stimulation (0.75 hr.) of O<sub>2</sub> consumption of cysteine-treated brain tissue is followed by a deep depression.

P. G. M.

**Growth and development. XL. Comparison of efficiency of horse, man, and motor with special reference to size and monetary economy.** S. BRODY and R. CUNNINGHAM (Missouri Agric. Exp. Sta. Res. Bull., 1936, No. 244, 56 pp.; cf. B., 1937, 82).—Data are given for O<sub>2</sub> consumption in work and at rest. The energetic efficiency is independent of live-wt. The work-rate capacity of animals  $\propto$  basal metabolism and not body-wt.

A. G. P.

**Growth and development of dairy calves on a milk diet.** H. A. HERMAN (Missouri Agric. Exp. Sta. Res. Bull., 1936, No. 245, 102 pp.).—Calves receiving milk only made rapid early growth (20% > normal wt. at 6 months), but failed to survive > 12 months. Supplementary feeding of Fe, Cu, Mn, and cod-liver oil prolonged survival for 1—2 months only. The dietary deficiency concerned is untraced.

A. G. P.

**Alimentary unbalance produced by various protein decomposition products.** R. LECOQ (J. Pharm. Chim., 1937, [viii], 25, 53—62).—Alimentary unbalance comparable with that produced by fructose (A., 1936, 368) occurs in pigeons when certain peptones are added to the equilibrated diet. Addition of 10% of uric acid, 2% of H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>, or 20% of urea to the normal diet causes polyneuritis, in spite of increased daily doses of vitamin-B.

J. N. A.

**Function of the large intestine of man in absorption and excretion.** C. S. WELCH, E. G. WAKEFIELD, and M. ADAMS (Arch. Int. Med., 1936, 58, 1095—1110).—Clinical data from a patient with an ileostomy and an isolated colon indicated that absorption of fat, carbohydrate, and protein is probably completed in the small intestine. The ileal dejecta contained much more H<sub>2</sub>O and NaCl than normal faeces and were approx. in osmotic equilibrium with the blood. No evidence was obtained that the colon possesses any excretory activity, its main function appearing to be absorption of H<sub>2</sub>O and NaCl.

W. O. K.

**Fate of glutathione introduced into blood *in vitro*.** S. A. NEUFACH (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4, 315—318).—Reduced glutathione introduced into defibrinated blood of dogs *in vitro* disappears in 30 min., but at 0° or in haemolysed blood the disappearance is retarded.

E. M. W.

**Production of tyramine in warm-blooded animals.** H. A. HEINSEN (Z. physiol. Chem., 1936, 245, 1—10).—Kidney (ox, dog, rabbit, guinea-pig) yields no tyramine (I) on autolysis or on addition of tyrosine (II), by which the respiration is not affected. Liver, lung, spleen, and muscle also yield no (I) on autolysis, but fresh pancreas and dry powder from pancreas (but not extracts obtained by grinding pancreas with physiological salt solution) yield (I) on autolysis ( $p_H$  6.5), the amount being greatly increased by addition of (II). The action is not bacterial. Fresh duodenal juice does not convert (II) into (I). Phenylalanine, histidine, and tryptophan are not decarboxylated by pancreas.

W. McC.

**Optical inversion of *d*-histidine in the animal body.** R. M. CONRAD and C. P. BERG (J. Biol. Chem., 1937, 117, 351—363).—*d*-Histidine administered to rats on a histidine-deficient diet promotes growth, the amounts of *l*-histidine subsequently found in their bodies indicating that at least partial conversion of the *d*- into the *l*-form is effected in the body.

F. A. A.

**Mercapturic acid synthesis in animals. I. Effect of diets of varying sulphur content on the extent of synthesis of *p*-bromophenylmercapturic acid in dogs.** J. A. STEKOL (J. Biol. Chem., 1937, 117, 147—159; cf. A., 1936, 756).—In adult dogs on diets having various S contents, the increase in urinary excretion of neutral S caused by giving PhBr is sometimes an untrustworthy measure of the amount of *p*-bromophenylmercapturic acid (I) synthesised in the organism. When the diets are low in S, administration of cysteine (II), *l*-cystine (III), and *dl*-methionine (IV), but not that of taurine, increases (I) synthesis. Possibly (II), (III), and (IV) provide S to replace tissue-S used for detoxicating PhBr rather than to react directly with PhBr.

W. McC.

**Histo-chemical investigation of lecithin metabolism in animals. I. Resorption of lecithin in the gut.** J. ACKERMANN (Bull. Acad. Polonaise, 1936, B, 177—188).—Lecithin (I) is not resorbed as such from the intestines of frogs fed with (I), but the constituent fatty acids pass, as neutral fats, through the epithelium. No increase in phosphatide is found in the gut, and (I) is not resynthesised there.

F. A. A.

**Utilisation of arsenic analogue of choline chloride in the bio-synthesis of phospholipins.** A. DE M. WELCH (Proc. Soc. Exp. Biol. Med., 1936, 35, 107—108).—Arsenocholine chloride is utilised by rats, fed on a low-choline diet, in the formation of lecithin etc.

P. G. M.

**Metabolism of sterols during the development of hen's eggs.** B. SKARZYŃSKI (Bull. Acad. Polonaise, 1936, B, 437—452).—The content of sterol (determined as digitonide) in unincubated hen's eggs varies considerably with different breeds, but little with the same breed. The total sterol in the developed embryo is > (by approx. 9.5%), and the ergosterol <, that in the unincubated egg; both contain dihydrocholesterol.

E. M. W.

**Spectroscopic changes in fatty acids. III. Biological activity of the acids of linseed oil in**

**different spectroscopic states.** T. MOORE (Biochem. J., 1937, 31, 148—154; cf. A., 1930, 810).—The inability of rats to subsist on a diet freed from fat is confirmed and the curative effect on the lesions developed on such a diet of the mixed acids of linseed oil both after brief and prolonged saponification is demonstrated. The solid acid does not appear to have any curative effects.

P. W. C.

**Lipæmia and milk-fat secretion in ruminants.** F. X. AYLWARD, J. H. BLACKWOOD, and J. A. B. SMITH (Biochem. J., 1937, 31, 130—137).—The rate of absorption of iodised fat in cows is followed. The blood concn. is at a max. after 1.5—2 days and then falls gradually to a very small val. in 5 days. The amount of iodised fat secreted in the milk appears to be directly related to the amount in the blood. The proportion of the dietary fat carried in the blood as phosphatide is that carried as non-phosphatide. Phosphatide is probably not therefore the chief means of transport in the blood nor is it the precursor of milk fat. The latter role appears to belong to the glycerides or cholesteryl esters or to both.

P. W. C.

**Morphological fatty degeneration, fat content, and metabolism of rat liver.** O. ROSENTHAL (Arch. Néerland. Physiol., 1936, 21, 503—516; cf. A., 1936, 389).—Determination of the neutral fat (I) content of rat livers having, histologically, different degrees of fatty degeneration shows that the formation of visible droplets of (I), besides diffused fat, is apparent when the (I) content is > 1.5%, and the no. of droplets approx.  $\propto$  the (I) content. No definite relation is established between the histological appearance and the cholesterol (II) or phosphatide (III) content, or the I val. Variations in (I) content between 1 and 5%, and variations of about 30% in total (II), (III), or degree of saturation of total fat, have no marked influence on the functioning of liver tissue.

F. A. A.

**Deposition of fat in the liver and carcass of the rat on diets high in fat and low in lipotropic factors.** H. J. CHANNON, G. N. JENKINS, and J. A. B. SMITH (Biochem. J., 1937, 31, 41—53; cf. A., 1936, 886).—A fat-free low-choline basal diet supplemented with 40% of fat produced intensely fatty livers (fat content 30.7% of fresh wt. after butter, 7.2% after cod-liver oil), but no relationship was found between the fat content of the liver and that of the carcass. The saturated acids of the liver glycerides closely resembled those of the carcass; the unsaturated acids were less closely related. No appreciable storage occurred in liver or carcass of products of desaturation of lower fatty acids if desaturation took place. The amounts of individual acids of the carcass fats were greatly affected by the fats of the diet. There was no relation between the fatty acids of the carcass and the phosphatide acids of the liver.

W. McC.

**Effect of sugars, starch, and yeast on the growth of albino rats.** M. MATSUOKA (Bull. Inst. Phys. Chem. Res. Japan, 1936, 15, 1293—1313).—Yeast and glucose, sucrose, or raw starch (not lactose) are necessary for growth of albino rats on a diet of fish meal (15—20), carbohydrate (55), butter (15).

and McCollum's salt mixture (5%). Cooked starch was ineffective. R. S. C.

**Biochemistry of carbohydrates. XIX. Theis and Benedict method applied to the determination of free phenols in tissues.** K. WATANABE. **XX. Prosthetic group of ovomucoid.** H. MASAMUNE and S. HOSHINO. **XXI. Assimilability and disintegration of *N*-acetylglucosamine.** **XXII—XXIV. Animal  $\beta$ -*N*-acetylglucosaminidase. I. II. Purification. III. Kinetics.** K. WATANABE (J. Biochem. Japan, 1936, 24, 215—218, 219—224, 287—295, 297—303, 305—313, 315—326).—**XIX.** The pulped tissue is deproteinised with  $\text{CCl}_3\text{CO}_2\text{H}$ , the filtrate is treated with  $\text{NaOH}$  to  $p_{\text{H}}$  6.6—7.8, and phenols are determined by the Theis-Benedict method (A., 1924, ii, 708). Data for the free phenol content of various ox tissues are tabulated, that of muscle (0.06—0.17%) being highest of the tissues examined.

**XX.** The prosthetic group of ovomucoid, isolated from the  $\text{Ba}(\text{OH})_2$  hydrolysate, consists of mannose and *N*-acetylglucosamine (I) (1:1 mol.).

**XXI.** (I), subcutaneously injected into rabbits, is recovered nearly quantitatively from the urine, which contains only traces of glucosamine. Ingested (I) is similarly recovered from the intestinal contents and faeces. Of the tissues (ox) examined *in vitro*, only liver (pulp) hydrolyses (I), only traces of (II) being formed; the optimum  $p_{\text{H}}$  is 6.7. The enzyme responsible is more labile than is glucosaminase (Kawakami, A., 1935, 402).

**XXII.** Ox-liver pulp contains an enzyme,  $\beta$ -*N*-acetylglucosaminidase (III), which liberates  $\text{PhOH}$  from *N*-acetylphenyl- $\beta$ -*D*-glucosaminide (Helferich and Iloff, A., 1934, 59) (optimum  $p_{\text{H}}$  approx. 3.7). The distribution of (III) in ox tissues is tabulated.

**XXIII.** Extraction of ox-liver pulp with dil.  $\text{AcOH}$  at  $p_{\text{H}}$  3.6—3.8, pptn. of the extract with 2 vols. of 95%  $\text{EtOH}$ , re-extraction of the ppt. with dil.  $\text{AcOH}$ , adsorption on kaolin at 7.0 followed by elution at  $p_{\text{H}}$  3.6, and dialysis of the eluate affords purified preps. of (III). The pptn. by  $\text{EtOH}$  produces some inactivation.

**XXIV.** The kinetics of the action of purified (III) (optimum  $p_{\text{H}}$  and temp. 3.8—4.1 and 40°, respectively) were investigated. (III) appears not to hydrolyse  $\beta$ -glucosaminides. F. O. H.

**Role of inosic acid in muscular glycogenolysis.** J. K. PARNAS and I. MOCHNACKA (Compt. rend. Soc. Biol., 1936, 123, 1173—1175).—Inosic acid can initiate the phosphorylative degradation of glycogen absent from muscle extracts after prolonged dialysis.

H. G. R.

**Ketosis. IX. Glycogen formation from various purified and natural fats.** H. J. DEUEL, jun., J. S. BUTTS, H. BLUNDEN, C. H. CUTLER, and L. KNOTT [with W. GOODWIN, C. GOULD, L. F. HALLMAN, R. HELLER, and S. MURRAY]. **X. Glycogen synthesis after ethyl esters of various fatty acids.** J. S. BUTTS, H. BLUNDEN, W. GOODWIN, and N. J. DEUEL, jun. (J. Biol. Chem., 1937, 117, 119—129, 131—133).—**IX.** Administration of triacetin, tributyrin, tricaproin, tricapylin (I) (triglycerides of acids with an even no. of C) to fasting rats is followed by deposition of an amount of glyco-

gen (II) which can be accounted for by the glycerol (III) of the triglycerides. After feeding tripropionin, trivalerin, or triheptoin, much larger amounts of (II) are deposited than could originate from their (III) content. Trilaurin possesses no glycogenic activity. Those fats which cannot be stored as such [up to (I)] are decomposed and the (III) used for (II) synthesis. Coconut oil and possibly butter fat serve as sources of (II) in proportion to the amount of triglyceride of small mol. wt. which they contain.

**X.** The Et esters of odd-C fatty acids ( $\text{C}_3$  to  $\text{C}_{11}$ ) give rise to glycogen when fed to fasting rats, whilst those of the even-C acids ( $\text{C}_4$  to  $\text{C}_{16}$  and oleic) do not, in spite of the fact that they are absorbed, metabolised, and give ketonic substances. P. W. C.

**Specificity of resorption of some monoses from the intestine of the rat and the pigeon.** H. G. K. WESTENBRINK (Arch. Néerland. Physiol., 1936, 21, 433—454).—The relative velocities of resorption of sugars from the pigeon intestine follow the order *D*-galactose, *D*-glucose, *D*-fructose, *D*-mannose, *L*-xylose (I), *L*-arabinose (II), the vals., as % of that of glucose, being 115, 100, 55, 33, 33, 16. The same order is found for resorption from rat intestine, the vals. being 108, 100, 42, 15, 13, 2. (I) is always more rapidly resorbed than (II) (cf. Wilbrandt and Laszt, A., 1933, 630). (I) is resorbed faster from pigeon intestine than *D*-xylose. The resorption of glucose and (I) in rats is restricted by  $\text{CH}_3\text{I}\cdot\text{CO}_2\text{Na}$  (III). Pigeons are killed by doses of (III) large enough to affect resorption. (III) probably acts on the circulatory system, rather than directly on the intestinal mucous membrane. F. A. A.

**Carbohydrate metabolism of brain. III. Origin of lactic acid.** S. E. KERR and M. GHANTUS (J. Biol. Chem., 1937, 117, 217—225; cf. this vol., 19).—In the brains of dogs during post-mortem autolysis, the free fermentable sugar (I) disappears in 3–5 min. and 80–85% of the glycogen (II) in 15 min. During anaerobic incubation for 2 hr. at 37°, the amount of lactic acid (III) produced corresponds with the amounts of (I) and (II) which disappear. For the first 3 min., (III) production corresponds with (I) + (II) disappearance and after 3 min. with (II) disappearance only. In autolysed brain from hyperglycaemic dogs, the max. (III) content corresponds approx. with the blood-sugar level at death, the precursors of (III) being the (I) (which is 50–66% of the blood-sugar val.) and (II) of brain. In brains from dogs treated with insulin the lowered max. (III) content represents the amounts of (I) and (II) available and corresponds with approx. 300% of the blood-sugar val. W. McC.

**Metabolism of sulphur. III. Excretion of cystine by normal individuals.** G. MEDES (Biochem. J., 1937, 31, 12—16; cf. A., 1936, 881).—The average urinary excretion of cystine (I) of 50 healthy persons was  $30.4 \pm 1.5$  mg. per 24 hr. (range 10—102 mg.). Positive correlations of  $0.46 \pm 0.07$  and  $0.65 \pm 0.05$  existed between (I) excretion and neutral S excretion and between (I) excretion and creatinine (II) excretion, respectively, but no significant correlation between (I) excretion and total N excretion or body-wt. In the urine the amount of cystine-S was

5—8% of neutral S and 4.5—8% of  $\text{NH}_2\text{-N}$ . In disease excretion of (I) and (II) and (probably)  $\text{NH}_2\text{-N}$  was not affected by consuming (I). The (I) excretion of an individual was 1.11 mg. per hr. when the diet was low in protein and 1.52 mg. when it was high. Differences between individuals were > variations in an individual on different diets.

W. McC.

**Mineral metabolism in the inhabitants of the tropics.** W. RADSMAN, J. V. KLERKS, and J. W. R. EVERSE (Arch. Néerland. Physiol., 1936, **21**, 574—586).—Vals. are given for the urinary and faecal Na, K, Ca, Mg, and  $\text{P}_2\text{O}_5$  output of natives of Batavia.

F. A. A.

**Variations in blood- and muscle-magnesium following repeated muscular contraction.** R. WOLFF, M. RANGIER, and A. BOURQUARD (Compt. rend. Soc. Biol., 1937, **124**, 140—142).— $\text{H}_2\text{O}$  in muscle is increased at the expense of liquid reserves other than the blood, but little variation in the Mg content is observed. A slight decrease in serum-Mg occurs.

H. G. R.

**Is *p*-aminobenzenesulphonamide the active agent in prontosil therapy?** A. T. FULLER (Lancet, 1937, **232**, 194—198).—After oral administration or injection of prontosil (I) *p*-aminobenzenesulphonamide (II) is excreted in the urine of human beings and mice. The therapeutic action of (I) may be due to the (II) produced from it by reduction in the body.

L. S. T.

**Raman effect and the concept of odour.** C. M. DYSON (Perf. Essent. Oil Rec., 1937, **28**, 13—19).—The shift frequencies of the Raman spectra of odorous org. compounds are correlated with the odours of the compounds and are suggested as a basis for the measurement and characterisation of odours, a definite osmic frequency being characteristic of a definite type of odour.

E. H. S.

**Liberation of acetylcholine in the blood of the pancreatic-duodenal vein [of dogs] by stimulation of the splanchnic nerve.** R. GAYET and B. MINZ (Compt. rend. Soc. Biol., 1936, **123**, 1157—1159).

H. G. R.

**Effect of nerve-cutting on the chemical composition of striped muscle.** H. G. K. WESTENBRINK and H. KRABBE (Arch. Néerland. Physiol., 1936, **21**, 455—464).—Severance of the main nerve in the leg of cats is followed by atrophy of the striped muscle (gastrocnemius). 3—3½ weeks after severance, creatinephosphoric acid, free  $\text{PO}_4'''$ , and myosin are 20—30% < in normal muscles; other constituents remain sensibly unaltered.

F. A. A.

**Is the fixation of chlorine constant in injured tissues during surgical operation?** R. LECOQ and A. MEUNIER (Compt. rend. Soc. Biol., 1937, **124**, 38—40).—The fixation (in rabbits and guinea-pigs) is not const. and in some cases (*e.g.*, muscle) may be due to increased blood-Cl.

H. G. R.

**Variation in the cardiac automatism as a function of the ratio  $\text{Na} + \text{K} : \text{Mg} + \text{Ca}$  in *Aplysia fasciata*.** A. JULLIEN (Compt. rend. Soc. Biol., 1937, **124**, 174—175).—If Mg or Ca is not present in the perfusate, the cardiac activity soon fails.

An excess of  $\text{Na} + \text{K}$  produces a positive chronotropic action, whilst with an excess of  $\text{Mg} + \text{Ca}$  it is negative.

H. G. R.

**Effects of thorium on blood- and liver-enzyme of white rats.** B. S. GOULD (Proc. Soc. Exp. Biol. Med., 1936, **35**, 77—78).—Injection of  $\text{Th}(\text{NO}_3)_4$  has no significant effect on the blood- and liver-enzymes of the rat.

P. G. M.

**Organic phosphorus compounds. II. Effect of tritetraethylammonium phosphate (edeine) on phosphorus metabolism.** M. CORAZZA and L. CERVELLATI (Arch. Farm. speriment., 1936, **62**, 117—130).—Subcutaneous or oral administration of  $(\text{NEt}_4)_3\text{PO}_4$  to rabbits with approx. const. excretion of P diminishes both the urinary and faecal P to an extent approx. equal to that due to equiv. doses of lecithin (*cf.* this vol., 18).

F. O. H.

**Diphenyl compounds and mammary growth.** G. A. GRANT (Nature, 1937, **139**, 155).— $\alpha\text{-C}_{10}\text{H}_7\text{-CPh}_2\text{-OH}$  and, to a slight extent,  $(p\text{-OH-C}_6\text{H}_4)_2$  function as initiators of mammary growth in young adult male guinea-pigs.  $(4:3\text{-OH-C}_6\text{H}_3\text{Me})_2$  is inactive.

L. S. T.

**Effect of aspirin on urinary excretion of ascorbic acid.** A. L. DANIELS and G. J. EVERSON [with F. I. SCOULAR and M. F. DEARDORFF] (Proc. Soc. Exp. Biol. Med., 1936, **35**, 20—24).—Aspirin increases the urinary excretion of ascorbic acid.

P. G. M.

**Structure and physiological action of  $\alpha$ -pyridones.** J. A. GAUTIER and J. LÉVY (Compt. rend. Soc. Biol., 1936, **123**, 1103—1106).—The pyridone nucleus has hypothermal properties and respiration is increased by substances substituted on the N by  $\text{-CH}_2\text{-CH}(\text{OH})\text{-CH}_2\text{-OR}$  ( $\text{R} = \text{Bu}$  or *iso*- $\text{C}_6\text{H}_{11}$ ).

H. G. R.

**Behaviour in the animal organism of fat-soluble dyes.** F. ROGOZINSKI and Z. GŁOWCZYNSKI (Bull. Acad. Polonaise, 1936, **B**, 349—360).—Sudan-III and scarlet-R ingested by hens and a goat appear in the eggs and subcutaneous fat of the former and in the milk-fat of the latter. Six other fat-sol. dyes have no effect.

E. M. W.

**Effect of leucylglycine on the excretion of total endogenous nitrogen and of purine and creatine derivatives.** A. GRADINESCO and C. DEGAN (Compt. rend. Soc. Biol., 1937, **124**, 79—82).—Leucylglycine causes no increase in the excretion of purine derivatives in animals on a carbohydrate diet, a small production of creatine being observed in some cases.

H. G. R.

**Modifications in the hyperglycemia induced during histolysis.** J. LOISELEUR (Compt. rend. Soc. Biol., 1936, **123**, 1128—1131).—After intraperitoneal injection of peptone or absorption of tissue destroyed by radiation, the time required for the blood-sugar to reach a max. after injection of glucose is increased.

H. G. R.

**Callicrein.** F. BISCHOFF and A. H. ELLIOT (J. Biol. Chem., 1937, **117**, 7—10).—The inactivation of a highly purified fraction of the depressor colloid of urine, callicrein (I), by methylation, acetylation, and reaction with  $\text{CS}_2$ ,  $\text{PhNCO}$ , and  $\text{CH}_2\text{O}$  is investig-

ated. (I) resembles prolan in physical properties but is somewhat less stable to chemical reagents. Since the effects of intravenous injection of (I) cannot be duplicated by intramuscular or intraperitoneal injection, its physiological significance is questionable.

**Properties of vagotonin.** D. SANTENOISE, T. BRIEU, and E. STANKOFF (Compt. rend. Soc. Biol., 1937, 124, 127—130).—Vagotonin gives typical protein reactions; its properties are compared with those of insulin. H. G. R.

**Relationship between the dose and effect of vagotonin.** D. SANTENOISE, E. STANKOFF, and M. VIDACOVITCH (Compt. rend. Soc. Biol., 1937, 124, 124—126).—The effect  $\propto$  the dose between the vals. necessary to give a min. and an optimal response, vals. which depend on the physical state of the animal. An expression is given for the relation between dose and duration of the effect. H. G. R.

**Effect of vagotonin on the blood-corpuscles of guinea-pigs.** R. GRANDPIERRE and P. GROGNOT (Compt. rend. Soc. Biol., 1937, 124, 122—124).—An increase in the erythrocyte count was observed. H. G. R.

**Role of the disintegration products of muscle in the production of alimentary and humoral disequilibrium.** R. LECOQ (Compt. rend. Soc. Biol., 1937, 124, 35—38).—Ingestion of desiccated or fresh muscle, or muscle-peptone, causes variations in blood-Cl and -urea similar to those of post-operative and obstetrical conditions. H. G. R.

[Pharmacology of] barbiturates. XIX. Barbiturate-picrotoxin antagonism. T. KOPANYI, C. R. LINEGAR, and J. M. DILLE (J. Pharm. Exp. Ther., 1936, 58, 199—228).—Treatment of barbiturate poisoning in man with picrotoxin and metrazol is discussed. E. M. W.

**Colloid chemistry of narcosis.** P. J. JURISÍČ (Kolloid-Z., 1937, 78, 95—99).—The rays transmitted through gelatin in the direction of an incident pencil of visible or infra-red light, when allowed to fall on a photographic plate, give rise to dark circles, the diameter of which remains const. during the sol-gel transformation. With thixotropic systems of serum + Et or Me urethane setting is accompanied by an increase in the diameter of the circles, whilst with serum + lactic acid there is a decrease. The setting of protoplasm which occurs in narcosis by means of substances either in the state of vapour or dissolved in Ringer's solution conforms to the gelatin type. F. L. U.

**Distribution of halogen derivatives of ethylene in the organism.** LE BIHAN (J. Pharm. Chim., 1937, [viii], 25, 20—23).—Vals. for the distribution of  $(\text{CHCl}_2)_2$  (I) in the organs and tissues of dogs after anaesthesia by (I) are tabulated. The concn. of (I) is highest in lipin-rich (liver, brain, spleen, lungs) and endocrine tissues (thyroid, adrenal) and especially in bone-marrow. Concns. of (I) in blood during and after anaesthesia are given. F. O. H.

**Comparison of [the pharmacological properties of] five choline compounds used in therapeutics :**

acetyl-, acetyl- $\beta$ -methyl-, carbaminoyl-, ethyl ether of  $\beta$ -methyl-, and carbaminoyl- $\beta$ -methylcholine chloride. H. MOLITOR (J. Pharm. Exp. Ther., 1936, 58, 337—360).—Comparative data are given for toxicity, circulatory and miotic action, and effect on gastro-intestinal tract and the isolated intestine and frog's heart. E. M. W.

**Acetylcholine and adrenaline secretion.** A. TOURNADE, C. SARROUX, and M. CHEVILLOT (Compt. rend. Soc. Biol., 1937, 124, 5—7).—The nicotine-like action of acetylcholine is due to adrenaline secretion. H. G. R.

**Is the nicotine-like action of acetylcholine due solely to hypersecretion of adrenaline ?** A. TOURNADE, C. SARROUX, and M. CHEVILLOT (Compt. rend. Soc. Biol., 1937, 124, 100—102).—The action cannot be due solely to adrenaline secretion since hypertension is observed in adrenalectomised animals after injection of acetylcholine. H. G. R.

**Mechanism of the intensification of the hypotensive action of acetylcholine by yohimbine.** G. MORIN and J. VIAL (Compt. rend. Soc. Biol., 1937, 124, 192—194).—The adrenolytic properties of yohimbine cause the intensification of the hypotensive action of acetylcholine. H. G. R.

**Effect of atropine on the adrenaline-secretory properties of acetylcholine.** H. HERMANN, F. JOURDAN, G. MORIN, and J. VIAL (Compt. rend. Soc. Biol., 1937, 124, 171—174).—Atropine enables the adrenaline-secretory properties of acetylcholine to be readily demonstrated by reinforcing its action on the adrenal glands. H. G. R.

**Liberation of acetylcholine in the blood of the pancreatic-duodenal vein [of dogs] after injection of ergotamine.** R. GAYET and B. MINZ (Compt. rend. Soc. Biol., 1936, 123, 1160—1162). H. G. R.

**Action of eserine and prostigmine on skeletal muscle.** R. S. MORISON and A. ROSENBLUETH (Science, 1936, 84, 551—552).—A discussion of apparently conflicting results. L. S. T.

[Pharmacological] actions of kurchicine, an alkaloid of *Holarrhena antidysenterica*. I. BAKHSH (J. Pharm. Exp. Ther., 1936, 58, 361—372).—The min. lethal dose (subcutaneous injection) of kurchicine is 0.051 and 0.088 g. per kg. for the frog and guinea-pig, respectively, and 0.160 for the mouse by intraperitoneal injection. The toxicity for *Paramoecium caudatum* is low (1 : 2500 fails to kill in 3 hr.) and *Amoeba proteus* is killed in 3 hr. at 1 : 5000. H. G. R.

**Pharmacological actions of conessine and isoconessine.** I. BAKHSH (J. Pharm. Exp. Ther., 1936, 58, 373—392).—Conessine (I) stimulates the smooth muscle of the intestine and uterus, the activity being < that of isoconessine (II). Small doses of either (I) or (II) slightly increase the blood pressure; larger doses cause a reduction. The min. lethal dose of (I) by subcutaneous injection is 0.10 and 0.115 g. per kg. for the frog and guinea-pig, respectively, and 0.126 for the mouse by intraperitoneal injection: (II) is only half as toxic towards laboratory animals but is 8 times as toxic to *Paramoecium*. H. G. R.

**Hyperglycæmic action of *Rehmannia glutinosa*, *Alisma plantago*, *Scrofularia Oldhami*, *Atractylis ovata*, and *Lycium chinense*.** K. L. PIN, S. Y. KAO, and L. T. PANG (Compt. rend. Soc. Biol., 1936, 123, 1155—1156).—The blood-sugar of normal rabbits is decreased by injection of EtOH extracts of the roots of the above plants.

H. G. R.

**Permeability studies with medicinal plant infusions.** L. I. WEBER and L. LECOIX (J. Pharm. Chim., 1936, [viii], 24, 563—569).—The dialysis through pig's intestinal membrane of many plant infusions has been studied. The rate of dialysis of glucose is increased in presence of plant infusions.

R. F. P.

**Toxicity of digitalin and ouabain administered suboccipitally.** F. MERCIER and J. DELPHAUT (Compt. rend. Soc. Biol., 1936, 123, 1209—1211).—The min. lethal doses of ouabain and digitalin in dogs are 0.03, 0.10, and 0.17, 1.73 mg. per kg. by the suboccipital and intravenous routes, respectively.

H. G. R.

**Vegetable heart poisons.**—See A., II, 100, 110.

**Carbohydrate metabolism in fungal poisoning (*Amanita phalloides*).** L. BINET and J. MAREK (Compt. rend. Soc. Biol., 1937, 124, 13—14).—Injection of an extract of the fungus causes a decrease in the free and protein-bound sugar and an increase in the lactic acid and residual chromic index of the blood.

H. G. R.

**Toxicity of rotenone.** H. B. HAAG (Soap, 1937, 13, No. 1, 112c—112d, 137).—Physiological effects of derris substances on laboratory animals are described. Lethal doses cause respiratory failure, but sub-lethal doses stimulate respiration. Oral toxicities of derris substances are listed, and increase (but not proportionally) with rotenone (I) content. Derris when inhaled can cause intoxication and death. (I) is about 8500 times as toxic when given intravenously as when given orally to rabbits. Derris and (I) lose their activity with exposure to sun and air. Residues on sprayed vegetables and fruits are not considered a source of danger to the consumer.

L. D. G.

**Toxicity of certain sugar alcohols and their anhydrides.** F. F. BECK, C. J. CARR, and J. C. KRANTZ, jun. (Proc. Soc. Exp. Biol. Med., 1936, 35, 98—99).—A direct relation exists between mol. wt. and toxicity to mice of alcohols with  $>4$  C. The reverse relation holds for their anhydrides.

P. G. M.

**Toxic effects of low concentrations of carbon disulphide.** F. H. WILEY, W. C. HUEPER, and W. F. VON OETTINGEN (J. Ind. Hyg., 1936, 18, 733—740).—Rats and mice exposed to air mixtures containing 1.09 and 0.114 mg. of CS<sub>2</sub> per litre for 8 hr. per day for 20 weeks showed severe toxic effects. Atm. concn. of CS<sub>2</sub>  $>0.1$  mg. per litre is regarded as dangerous.

A. L.

(A) Biological activity of aromatic and heterocyclic arsonium bases. (B) Influence of the anion of dimethylphenazarsonium salts on biological activity. V. KARASIK and M. LICHTACHEV (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4,

319—321, 322—324).—(A) The toxicity of dimethylphenarsazine (I) is due to the NH group and is reduced by replacement of NH with O or a direct linking.

(B) The toxicity of (I) is reduced by replacement of OH with NO<sub>2</sub>, OAc, and HSO<sub>4</sub> in the proportion 17:12:4:1. The type of toxicity alters considerably with the anion.

E. M. W.

**Toxic action and detection of metallic phosphides.** F. HAUN (Z. Unters. Lebensm., 1936, 72, 309—312).—The symptoms of poisoning in mice and hens are described. Zn<sub>3</sub>P<sub>2</sub> is detected in fresh material by the liberation of PH<sub>3</sub> and by the presence of Zn. In stale material use of Zn<sub>3</sub>P<sub>2</sub> is inferred from the presence of Zn and the symptoms shown.

E. C. S.

**Comparative diuretic response to clinical injections of various mercurials.** T. SOLLMANN and N. E. SCHREIBER (Arch. Int. Med., 1936, 58, 1067—1086).—The diuresis and excretion of Hg in the urine following administration to patients of various org., colloidal, and inorg. Hg compounds indicate that, although in relation to the therapeutic dose the org. mercurials are the most active, in relation to actual dose and, more especially, to the Hg excreted, the inorg. salts are the most powerful, followed by the colloidal compounds. The results suggest that the diuretic action of org. mercurials is dependent on the liberation of small quantities of ionised Hg, which then acts on the kidney.

W. O. K.

**Toxicity of fluorine derivatives.** P. SIMONIN and A. PIERRON (Compt. rend. Soc. Biol., 1937, 124, 133—134).—The toxicities of 30 F compounds to fish, frogs, and guinea-pigs are tabulated.

H. G. R.

**Effect of low levels of fluorine intake on bones and teeth.** G. ELLIS and L. A. MAYNARD (Proc. Soc. Exp. Biol. Med., 1936, 35, 12—16).—The F content of the bones and teeth of rats fed on a basal diet (containing 3 p.p.m. of F) to which 8—14 p.p.m. of F were added  $\propto$  the amount fed. NaF and bone meal are equally effective. The F content of bones and teeth increases during growth.

P. G. M.

**Action of enzymes and  $p_H$ .** Action of short and ultra-short Herzian waves on fermentation organisms and enzymes.—See B., 1937, 76.

**Co-enzymes concerned with hydrogen transference.**—See A., II, 114.

**Oxidation of nucleic acid in tissues. II. Enzymic dehydrogenation of yeast-nucleic acid in muscle. III. Enzymic dehydrogenation of yeast-nucleic acid in blood.** Y. TSUGE (J. Biochem. Japan, 1936, 24, 127—131, 133—138; cf. A., 1935, 1272).—II. Dehydrogenation (indicated by methylene-blue) of yeast-nucleic acid in fresh muscle extracts has optimum 7.0—7.1 and occurs, to a smaller extent, in muscle removed some time after death and in dried muscle preps.

III. A slight dehydrogenase activity is apparent in human serum and, to a smaller extent, in hemolysed erythrocytes. The enzyme could not be detected in rabbit's blood.

F. O. H.

**Nature of the oxygen-transferring enzyme of respiration in plants.** W. KEMPNER (Plant Physiol.,

1936, 11, 605—613).—The enzyme is a heavy-metal (Fe) compound. Its CO compound dissociates in light and inhibition of respiration by CO then ceases. It is probably identical with phæohæmin. A. G. P.

**Correlation of the yellow oxidation enzyme with Warburg's co-enzyme.** J. KENNER (Nature, 1937, 139, 25—26).—The nature of the changes in which these enzymes participate is discussed.

L. S. T.

**Effect of inhibitors on succinoxidase.** V. R. POTTER and C. A. ELVEHJEM (J. Biol. Chem., 1937, 117, 341—349).—Succinic dehydrogenase occurs in greater amounts in chicken and rat kidneys than in other tissues. The system is inhibited by  $\text{CN}'$ ,  $\text{Na}_2\text{SeO}_3$ , or  $\text{Na}_3\text{AsO}_3$  but not by  $\text{NaF}$ ,  $\text{Na}_2\text{SeO}_4$ , or  $\text{Na}_3\text{AsO}_4$ . Malonic and oxalic acids also inhibit the oxidation of succinic acid by the system; glutaric, adipic, aspartic, malic, and fumaric acids inhibit it to a much smaller extent, only the last two acids being oxidised.

F. A. A.

**Modification of Eckerson's method for determining nitrate reductase.** A. D. HIBBARD (Plant Physiol., 1936, 11, 657—658).—The method (A., 1931, 1200) is modified by using a large proportion of buffer solution to prevent change of  $p_{\text{H}}$  during incubation and by removing plant pigments by activated C prior to the determination of  $\text{NO}_2'$ . A. G. P.

**Combined action of eosin and light. Action of catalase in photodynamic phenomena.** M. ROCHA E SILVA (Compt. rend. Soc. Biol., 1937, 124, 148—150).—Hæmolysis and oxidation of hæmoglobin by  $\text{H}_2\text{O}_2$  are markedly increased if catalase is inactivated by  $\text{CN}'$ .

H. G. R.

**Action of irradiated eosin on the system potassium iodide-catalase as a model of photodynamic action.** M. ROCHA E SILVA (Compt. rend. Soc. Biol., 1937, 124, 146—147).—A slight inhibitory effect on the oxidation is observed with catalase inactivated by heat.

H. G. R.

**Combined action of eosin and light. Inhibitory action of catalase on the oxidation of potassium iodide by irradiated eosin.** M. ROCHA E SILVA (Compt. rend. Soc. Biol., 1937, 124, 143—145).—Oxidation of KI by irradiated eosin is reduced by catalase, showing that  $\text{H}_2\text{O}_2$  is an intermediary in this reaction.

H. G. R.

**Koji-amylase.** V. Difference between amounts of amylase, maltase, invertase, and protease extracted with water and salt solution. Y. TOKUOKA (J. Agric. Chem. Soc. Japan, 1937, 13, 35—40; cf. this vol., 67).—The yield of amylase from saké-koji was much, that of the other three enzymes only slightly, increased by extraction with 1% aq. NaCl instead of  $\text{H}_2\text{O}$ ; the yields of invertase and protease were increased by autolysis of washed material prior to extraction.

R. M. M. O.

**Taka-amylase.** XIV. Selectivity of adsorbents. 7. Polyaluminium hydroxide B. XV. Selective adsorption of takadiastase solutions purified by adsorption. XVI. Summary. T. KITANO (J. Soc. Chem. Ind. Japan, 1936, 39, 389—390B, 390—391B, 391—392B; cf. A., 1936, 1024).—

XIV. Poly- $\text{Al}(\text{OH})_3$  A and B resemble each other in their adsorptive powers. After repeated adsorptions with B the amylase (I) of takadiastase (II) is adsorbed, leaving maltase (III) in solution.  $\text{PO}_4'''$  is the best eluent of (I).

XV. The effect of adsorbents on the  $\text{PO}_4'''$  eluate of the adsorbates on A and B is investigated. (I) can be obtained free from (III) by repeated adsorption of the eluate with kaolin. (III) can be obtained by adsorption with a German activated earth from the residues and wash liquors.

XVI. The selectivity of various adsorbents for (I) and (III) is tabulated and a schematic representation of the resolution of (II) into (I) and (III) is given.

E. A. H. R.

**Degradation of lecithin. Separation of choline from lecithin by taka-diastase.** T. YOSINAGA (J. Biochem. Japan, 1936, 24, 21—30).—Lecithin (from egg-yolk) is decomposed by taka-diastase with production of choline, the optimum  $p_{\text{H}}$  being approx. 4.

F. O. H.

**Action of typhus-toxin on organ and muscle enzymes.** G. BAUMANN (Arch. Hyg. Bakt., 1936, 117, 112—128).—In animal experiments investigating the poisoning effect of variable doses of typhus toxin on the lipolytic and diastatic activity of enzymes in heart, brain, liver, etc., acute poisoning caused decreased enzymic activity, but a higher level of lactic acid production in muscle. *In vitro* experiments, however, showed a decrease in the formation of lactic acid in muscle. Chronic poisoning over longer periods showed no effect on the activity of either organ or muscle enzymes and *in vitro* experiments on material from immunised animals showed no abnormalities.

W. L. D.

**Kinetics of ester hydrolysis by enzymes.** VII. Autocatalytic increase in rate of ester hydrolysis by pancreatic lipase. E. BAMANN and C. FEICHTNER (Biochem. Z., 1936, 288, 295—298; cf. A., 1936, 520).—Neutralised aq.  $\text{NH}_3$  extracts of  $\text{COMe}_2$ -dried pancreatic preps. increase in lipase activity on keeping for some hr. at room temp. The increase, which is due to either formation of an additional enzyme carrier or removal of inhibitory protein-like substances, is more marked with simple (e.g.,  $\text{PrCO}_2\text{Me}$ ) than with complex (e.g., tributyrin) esters.

F. O. H.

**Determination of lipase in official [pharmacopœial] pancreatin.** H. PÉNAU and J. GUILBERT (J. Pharm. Chim., 1937, [viii], 25, 5—17).—A method, depending on the determination of the hydrolysis of purified tributyrin in presence of agar, glycine, and  $\text{NaPO}_3$  buffer ( $p_{\text{H}}$  8.8—9.1) by preps. of the pancreatin in aq. lactose for 2 hr., is described (cf. A., 1936, 520).

F. O. H.

**Spectroscopy of purified enzymes.** III. Lipase, urease, and tyrosinase. R. IRON (J. Biochem. Japan, 1936, 24, 279—286; cf. A., 1936, 758).—The ultra-violet absorption spectra of lipase (*Ricinus*), urease, and tyrosinase show max. bands at 278, 265, and 276  $\text{m}\mu$  (at  $p_{\text{H}}$  7 and shifting with change in  $p_{\text{H}}$ ), respectively. The bearing of the vals. for caseinogen (277 at  $p_{\text{H}}$  9.2), ovalbumin (280), tyrosine

(275), tryptophan (280), and phenylalanine (262 m $\mu$ ) on the above data is discussed. Aliphatic NH<sub>2</sub>-acids show no appreciable absorption. F. O. H.

**Co-carboxylase.** K. LOHMANN and P. SCHUSTER (Naturwiss., 1937, 25, 26—27).—Co-carboxylase (I) contains 2 PO<sub>4</sub>, one of which is removed readily, and the other with difficulty, by acid hydrolysis. The monophosphate, like (I), crystallises as the HCl salt; it has no (I) activity. On oxidation with alkaline K<sub>3</sub>Fe(CN)<sub>6</sub> (I), like vitamin-B<sub>1</sub>, gives a product with a blue fluorescence in ultra-violet light and on cleavage with SO<sub>3</sub>'' it gives a pyrimidine and a diphosphorylated thiazole. (I) can replace -B<sub>1</sub> in the catatorulin test but -B<sub>1</sub> has no (I) activity. E. A. H. R.

**Liver aldehydease.** R. LEMBERG, R. A. WYNDHAM, and N. P. HENRY (Austral. J. Exp. Biol., 1936, 14, 259—274).—Oxidation of aldehydes and purines by enzyme preps. from milk, human and ox liver is due to the action of xanthine oxidase (I) alone. Liver enzyme systems of other species contain an aldehydease (II) as well as (I). Inhibition of (II) by uric acid (III) is non-competitive, and aldehyde oxidation may even be accelerated by (III).

E. A. H. R.

**Carboligase.** Y. TOMIYASU (Biochem. Z., 1936, 289, 97—103).—*l*-Acetoin, [ $\alpha$ ]<sub>D</sub> -40°, is produced by various yeasts from MeCHO (as distinct from "nascent" MeCHO obtained by decarboxylation of AcCO<sub>2</sub>H) and the existence of carboligase is thus confirmed. P. W. C.

**Influence of monochromatic light on action of soya-urease.** R. MURAKAMI (J. Agric. Chem. Soc. Japan, 1937, 13, 46—51).—A slight but regular difference in NH<sub>3</sub> liberation was found in different types of illumination; activity was greatest in a spectrum including ultra-violet, less with shielding from ultra-violet, and less still with monochromatic light of various colours. R. M. M. O.

**Arginase.** S. EDLBACHER and A. ZELLER [with M. BECKER] (Z. physiol. Chem., 1936, 245, 65—75; cf. A., 1936, 1420).—The action of arginase (I) at  $p_H$  9.4 is > that at 6.81. KCN in alkaline medium does not affect the activation of (I) by Mn. Trypsin (II) at  $p_H$  8.8 rapidly inactivates (I), which therefore probably contains a protein as carrier. Mn (but not Fe) counteracts but does not reverse inactivation by (II). W. McC.

**Distribution of enzymes in protoplasm.** H. HOLTER and K. LINDERSTRÖM-LANG (Monatsh., 1936, 69, 292—313).—The distribution of peptidase in *Arbacea punctulata*, *Echinarachnius parma*, *Chaetopterus pergamentaceus*, and *Psammechinus miliaris* and of catalase in *P. miliaris* has been studied. In all cases the enzymes follow the hyaline mother substance of the cytoplasm and are not united in appreciable amount to the granular cell components or the cell nucleus. H. W.

**Proteolytic enzymes. XII. Specificity of aminopeptidase and carboxypeptidase. New type of enzyme in the intestinal tract.** M. BERGMANN and J. S. FRUTON (J. Biol. Chem., 1937, 117, 189—202; cf. A., 1936, 1557).—Since aminopeptidase (I) from intestinal crepsin hydrolyses *l*-leucyl- (II)

and *l*-alanyl-glycylglycine (III) but does not attack *d*-leucylglycylglycine, *l*-alanylsarcosylglycine (IV), glycylsarcosine (V), or carbobenzyloxy-*l*-proline (VI) it requires peptide-H (i.e.,  $\cdot\text{CO}\cdot\text{NH}\cdot$ ) for its action. Crude (I) also hydrolyses glycyl-*l*- (VII) and -*dl*-proline (VIII) and hence contains prolidase (IX) which attacks linkings without peptide-H (i.e.,  $\cdot\text{CO}\cdot\text{N}\cdot$ ). (IX) attacks (VII) but not glycyl-*d*-proline (V), or (VI). 0.083*M*-KCN inhibits the action of (I) and of dipeptidase but only slightly diminishes that of (IX). NHPH-NH<sub>2</sub> only slightly diminishes the actions of (I) and (IX) and does not affect that of carboxypeptidase (X). (I) is sp. only to the NH<sub>2</sub>-acid carrying the free  $\cdot\text{NH}_2$  of the substrate, converting (II) into *l*-leucine and glycylglycine. The sp. hydrolysis of (III) and of its *d*-form and the sp. hydrolysis of peptides by (X) proceed according to the authors' poly-affinity theory. A method of classifying peptidases is suggested. Sarcosylglycine with carbobenzyloxy-*l*-alanyl chloride gives the *carbobenzyloxy*-derivative, m.p. 108°, of (IV). The Et ester of carbobenzyloxy-*d*-alanylglycine with N<sub>2</sub>H<sub>4</sub> gives the corresponding *hydrazide*, m.p. 147—148°, which, after treatment with HCl and NaNO<sub>2</sub>, reacts with the CH<sub>2</sub>Ph ester of glycine to yield the CH<sub>2</sub>Ph ester, m.p. 116°, of carbobenzyloxy-*d*-alanylglycylglycine. In the same way are obtained the *hydrazide*, m.p. 145—147°, and the CH<sub>2</sub>Ph ester, m.p. 114—116°, of carbobenzyloxy-*l*-alanylglycylglycine. *Carbobenzyloxylglycyl-dl*-proline, m.p. 129—130°, -*l*-alanine, m.p. 135°, [ $\alpha$ ]<sub>D</sub><sup>25</sup> -9.5° in EtOH, and *d*-alanine, m.p. 135°, [ $\alpha$ ]<sub>D</sub><sup>25</sup> +9.3° in EtOH, were also prepared. W. McC.

**Proteolytic enzymes of rabbit's pancreas. I. Maceration juice of rabbit's pancreas and mucosa of small intestine. II. Pancreatic juice.** F. ITZIOKA (J. Biochem. Japan, 1936, 24, 139—151, 267—277).—I. Pancreatic macerates contain active trypsin and peptidase (optimum  $p_H$  7.0—8.0), exhibit proteolytic activity at  $p_H$  5.5—6.0, and hydrolyse chloroacetamido-acids, benzoyl-leucylglycine, or bromoisohexoyldiglycine but not benzoyl- (I) or bromoisohexoyl-glycine (II). Macerates of the mucosa of the small intestine exhibit tryptic and ereptic activity but do not hydrolyse (I), (II), or benzoyldiglycine.

II. The fresh juice hydrolyses caseinogen (III), gelatin, glycinin, and (III)-peptone only when activated ( $p_H$  7.0—8.0) with kinase from the small intestinal mucosa; (III) is then hydrolysed also at  $p_H$  6.0—6.5. Di- and tri-peptides are not hydrolysed and albumin only slightly; the ereptic activity of pancreatic maceration juice is hence due to tissue-peptidase. Some halogeno-acylamino-acids, but not -acyldipeptides, are hydrolysed. F. O. H.

**Activity of proteinases in flour.** A. K. BALLS and W. S. HALE (Cereal Chem., 1936, 13, 656—664).—Cysteine and glutathione increase the autolysis of flour-proteins, the change being not merely in state of aggregation but also in chemical composition. Similar effects are produced by CN' and SO<sub>3</sub>''. The relatively large quantities of these required and the presence of  $\cdot\text{SH}$  in the liquid indicate that they not only activate the enzyme but themselves reduce the protein. E. A. F.

**Phosphatase and hexose phosphate in the banana.** N. I. DALE (Austral. J. Exp. Biol., 1936, 14, 329—333).—The pulp of the Cavendish banana contains an enzyme hydrolysing glycerophosphoric acid and also a  $\beta$ -phosphatase. During the ripening process both fructose diphosphate and a hexose monophosphate are probably present in the banana.

E. A. H. R.

**Serum-phosphatase in cats with total bile stasis.** A. CANTAROW, H. L. STEWART, and S. G. McCOOL (Proc. Soc. Exp. Biol. Med., 1936, 35, 87—89).—No relation exists in the cat between serum-phosphatase and either duration of biliary stasis or degree of bilirubinemia.

P. G. M.

**Action of phosphate on oxidation and phosphorylation in the apozymase system poisoned by fluoride.** A. LENNERSTRAND (Biochem. Z., 1936, 289, 104—135).—In the system apozymase + cozymase + hexosediphosphoric acid + glucose + NaF +  $\text{PO}_4'''$  buffer, phosphorylation occurs and the amount of difficultly hydrolysable phosphoric ester increases. After addition of pyocyanine or methylene-blue the system absorbs  $\text{O}_2$ , and phosphorylation and amount of difficultly hydrolysable ester increase. Both  $\text{O}_2$  uptake and phosphorylation finally cease, due to irreversible inactivation of cozymase.  $\text{O}_2$  uptake and phosphorylation depend on the amount of inorg.  $\text{PO}_4'''$  present. Both processes are increased by addition of adenylic or adenosinetriphosphoric acid.

P. W. C.

**Easily hydrolysed phosphate from cozymase.** R. VESTIN and H. VON EULER (Z. physiol. Chem., 1936, 245, I—III).—Cozymase, inactivated by heating for 3—10 min. at  $100^\circ$  with 0.05—0.1N-NaOH, loses about 33% of its P on hydrolysis with *N*-HCl, as much P being eliminated in the first 7 min. as in the succeeding 2—3 hr. No P is eliminated by HCl after inactivation with NaOH at room temp. The P is not eliminated as adenylic or ribosephosphoric acid. Possibly NaOH liberates adenosinediphosphoric acid or a related compound.

W. McC.

**Heat of reaction of the aldol condensation with formation of hexose-1-phosphoric acid.**—See A., I, 138.

**Preparation of a highly active alcohol apodehydrogenase from yeast.** M. SREENIVASAYA (Nature, 1937, 139, 112).—The purified prep. (method described) is 135 times as active as the original yeast extract.

L. S. T.

**Phosphoric acid esters from yeast extract. Isolation of a crystalline calcium salt consisting of an equimolecular mixture of glucose monophosphate and glycerophosphate.** C. V. SMYTHE (J. Biol. Chem., 1937, 117, 135—146).—Yeast extracts afford a cryst. Ca salt,  $\text{C}_6\text{H}_{11}\text{O}_5\text{P}_2\text{Ca}_2$ , of an acid,  $[\alpha] +29.4^\circ$ , the K salt of which is readily fermented by yeast extract. The P is very resistant to hydrolysis. It consists of an equimol. mixture of glucose monophosphate (I) and glycerophosphate (II), (I) being separable as the brucine salt, and (II) after removal

(I) by fermentation. (I) and (II), on mixing in equimol. proportions, yield a similar cryst. Ca salt.

P. W. C.

**Synthesis of reserve carbohydrate by yeast. III. Nature of the insoluble carbohydrate.** R. A. McANALLY and I. SMEDLEY-MACLEAN (Biochem. J., 1937, 34, 72—80).—The insol. material separated from the yeast by the action of hot 60% aq. KOH contains a polysaccharide, Mg, and  $\text{PO}_4'''$ . Mg and  $\text{PO}_4'''$  are removed by cold *N*-HCl, leaving a  $\text{H}_2\text{O}$ -sol. polysaccharide closely resembling glycogen and a  $\text{H}_2\text{O}$ -insol. substance converted by *N*-HCl into glucose and a  $\text{H}_2\text{O}$ -insol. carbohydrate (I) (triacetate). (I), which contains an acid group, is responsible for the immunological properties of yeast and in serological properties resembles but is not identical with the sp. polysaccharide of type II pneumococcus.

W. McC.

**Increase in alcohol production by irradiated yeast.** T. D. BECKWITH and S. E. DONOVICK (Proc. Soc. Exp. Biol. Med., 1936, 35, 36—38).—An initial decrease in EtOH production by irradiated yeast is followed after about 3 days by a permanent increase.

P. G. M.

**Effect of 4 : 6-dinitro-*o*-cresol on oxidation of *d*- and *l*-arabinose by previously starved yeast.** J. FIELD, 2nd., and E. G. TAINTER (Proc. Soc. Exp. Biol. Med., 1936, 35, 168—170).—Increase in  $\text{O}_2$  consumption with *l*-arabinose as nutrient is  $>$  that with *d*-arabinose but  $<$  that with glucose following addition of 4 : 6-dinitro-*o*-cresol.

P. G. M.

(A) Emulsifying power of, (B) activation of fermentation by, medicinal plant infusions. L. I. WEBER and L. LEGOIX (J. Pharm. Chim., 1937, [viii], 25, 24—26, 26—28).—(A) The infusions varied considerably in their emulsifying power when tested on  $\text{H}_2\text{O}$ -oil (olive, castor, cedar, butter, cod-liver).

(B) Infusions of low  $\sigma$  (e.g., absinthe) enhance the fermentation of sugar by yeast as indicated by the rate of evolution of  $\text{CO}_2$ .

F. O. H.

**Use of the nephelometer in investigations on yeast.** G. MEDVEDEV and A. SCHELAUMOVA (Biochem. Z., 1936, 289, 52—54).—The cell counts of yeast suspensions of different concn. in  $\text{H}_2\text{O}$ , *M*- and 1.5*M*-NaCl are determined nephelometrically using a standard of known cell count. The vals. agree with direct cell counts. Shrinkage of the cell surface did not affect the nephelometric count.

P. W. C.

**Citric acid fermentation. I.** S. NAKAZAWA, Y. TAKEDA, and M. NAKANO (J. Agric. Chem. Soc. Japan, 1937, 13, 52—62).—A new variant of *Aspergillus Awamori*, Nakazawa, was found to give 65% transformation of sucrose into citric acid in a buffered culture solution.

R. M. M. O.

**Citric acid fermentation.** R. BAETSLÉ (Natuurwetensch. Tijds., 1937, 19, 5—9).—Optimum yields of citric acid (I) are obtained by fermenting slightly acidulated ( $p_H$  1.8—2.2), unsterilised solutions of moist sucrose with *Aspergillus niger* in presence of  $\text{NH}_4\text{NO}_3$  (0.2%),  $\text{KH}_2\text{PO}_4$  (0.1%), and  $\text{MgSO}_4$  (0.05%) at  $26^\circ$  for 6 days. The rate of fermentation and the yield of (I) increase with the concn. of sugar but the highest % yield is obtained with 20% solutions. With higher temp. ( $30^\circ$ ), longer time of fermentation, or larger amounts of  $\text{NH}_4\text{NO}_3$  the yield is diminished and

small quantities of  $\text{H}_2\text{C}_2\text{O}_4$  and gluconic acid are formed. S. C.

**Biochemistry of the filamentous fungi. V. Mycelial constituents of *Oospora sulphureo-ochracea*. II.** H. NISHIKAWA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 1—7).—Of four cryst. substances previously isolated from the  $\text{Et}_2\text{O}$  extract of the mycelium (A., 1936, 1247) one, m.p.  $257^\circ$  (decomp.), having 4 OH and 2 OMe, is now regarded as  $\text{C}_{20}\text{H}_{20}\text{O}_8$ . Fusion with KOH and reduction of the product yields a substance, m.p.  $113^\circ$ , probably a monomethyl-xanthen. Another may be  $\text{C}_{19}\text{H}_{18}\text{O}_8$  and not  $\text{C}_7\text{H}_{16}\text{O}_8$  as previously stated; fusion with KOH yields a phenolic acid,  $\text{C}_{15}\text{H}_{14}\text{O}_8$ , having no OMe. A new phenolic acid,  $\text{C}_{16}\text{H}_{14}\text{O}_8$ , with one OMe, was isolated from the  $\text{COMe}_2$  extract. R. M. M. O.

**Influence of partial vacuum or pressure on biochemical properties of lower fungi.** A. SARTORY, R. SARTORY, and J. MEYER (Compt. rend., 1936, 203, 1289—1291).—*Mucor spinosus* utilises sucrose (I) in a Raulin medium more easily in an atm. poor in or free from  $\text{O}_2$  than in air. *A. fumigatus* utilises scarcely any (I) in a vac., but it can utilise sol. starch equally as well in a vac. as in air. (I) is utilised only moderately by *Eurotium diplocyste* anaerobically. J. N. A.

**Anthocyanin from *Actinomycetes*.** A. E. KRISS (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4, 283—287).—The colour of cultures of *Actinomyces violaceus ruber* (Waksman) in a modified Czapek medium varies with the nature of the N source and with  $p_{\text{H}}$ . The pigment (properties and absorption spectra recorded) is an anthocyanin. A. G. P.

**Nitrogen-fixing power of *Bact. radiclecola*.** A. P. VERNER and A. A. KOVALEV (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4, 325—329).—The presence of bios in the culture medium stimulates reproduction and  $\text{N}_2$  fixation. E. M. W.

**Physiology of *Rhizobium*. VII. Effects of accessory growth factors.** D. W. THORNE and R. H. WALKER (Soil Sci., 1936, 42, 301—310; cf. A., 1936, 1559).—In  $\text{KNO}_3$  or  $\text{NH}_4\text{Cl}$  media, brown cane sugar, extracts of soil, lucerne, yeast, or of culture media of *Azotobacter vinelandii* lowered the R.Q. of *R. trifolii*. Agar acted similarly on *R. meliloti* in glucose- $\text{NO}_3$  but not in yeast extract media. The accessory substances probably lower the oxidation-reduction potential of the media by providing a H donator, and afford an initial source of energy to enable the organism to establish favourable growth conditions. A. G. P.

**Polysaccharide synthesised by a soil micro-organism.**—Sec A., II, 87.

**Hydrogen and carbon dioxide photoassimilation in purple bacteria.** C. S. FRENCH (Science, 1936, 84, 575). L. S. T.

**Sulphide formation by sulphur bacteria.** R. L. STARKEY (Proc. Soc. Exp. Biol. Med., 1936, 35, 120—122).—Bacteria (*Th. thiooxidans* etc.) which hydro-  
genate S during growth are considered to contain compounds which have active  $\cdot\text{SH}$ . P. G. M.

**Assimilation of different organic substances by saprophytic flagellates.** E. G. PRINGSHEIM (Nature, 1937, 139, 196).—All organisms investigated developed well on AcOH and EtOAc, but differed in their ability to assimilate other org. compounds. The homologues of AcOH are not so generally accepted; the longer is the C chain the more rarely is the acid assimilated. Succinic acid is also utilised by many flagellates, and malic, lactic, and pyruvic acids to a smaller extent. L. S. T.

**Nitrogen circulation. III. Degradation of glycine by bacteria.** A. JANKE and W. TAYENTHAL (Biochem. Z., 1936, 289, 76—86; cf. A., 1930, 1621).—Glycine is deaminated in feebly alkaline solution by resting cultures of *Ps. fluorescens*, *Bac. mycoides*, *B. coli*, and *B. vulgare*. With *B. mycoides* and *B. coli*, deamination in presence of  $\text{O}_2$  occurs best at  $p_{\text{H}}$  7.5—8 and in presence of  $\text{N}_2$  occurs only in presence of  $m\text{-C}_6\text{H}_4(\text{NO}_2)_2$ , the process being oxidative.  $\text{CHO}\cdot\text{CO}_2\text{H}$ , which appears as an intermediate product, is detected as dinitrophenylhydrazine and is to some extent decarboxylated,  $\text{CH}_2\text{O}$ ,  $\text{HCO}_2\text{H}$ , and MeOH being also detected. Enzyme preps. of these organisms did not deaminate. P. W. C.

**Metabolism of *Escherichia coli* in synthetic media.** C. E. CLIFTON, S. F. CAHEN, and G. MORROW (Proc. Soc. Exp. Biol. Med., 1936, 35, 40—44).— $\text{CO}_2$  production increases to a max. and then decreases in old cultures as the concn. of nutrient diminishes. P. G. M.

**Fermentative properties of *Vibrio cholerae*.** C. COMBIESCO-PORESCO and I. COCIOBA (Compt. rend. Soc. Biol., 1937, 124, 151—153).—The fermentative properties with various sugars are compared with the agglutinating properties. H. G. R.

**Viscosity measurements on *S*- and *R*-forms of *B. pneumoniae*.** W. C. DE GRAAFF (Natuurwetensch. Tijds., 1937, 19, 24—26).—The  $\eta$  of filtered culture liquors from *B. pneumoniae* is higher for the *S* than for the *R* type, which are flocculated by tannin solutions at dilutions of 1:400 and 1:600, respectively. The differences are due to the *S* form being covered by a mucus layer. S. C.

**Action of derivatives of *p*-aminophenylsulphonamide (1162 F) on haemolytic streptococci in vitro.** F. NITTI, D. BOVER, and F. DEPIERRE (Compt. rend. Soc. Biol., 1937, 124, 16—18).—The *o*- and *m*-isomerides are inactive. H. G. R.

**Chemotherapy of *p*-aminophenylsulphonamide derivatives in streptococcal infections.** J. TRÉFOUËL, (MME.) J. TRÉFOUËL, F. NITTI, and D. BOVER (Ann. Inst. Pasteur, 1937, 58, 30—47; cf. A., 1936, 1029).—The *o*- and *m*-isomerides are ineffective against streptococcal infections in mice. Replacement of the  $\cdot\text{SO}_2\cdot\text{NH}_2$  gives rise to inactive products. Addition of a third radical, particularly in the *m*-position, decreases activity, as does also substitution of the  $\cdot\text{NH}_2$ . The activity of the methyl- and diethylsulphonamides is comparable with that of the parent substance. Rabbits which have recovered from an infection by the above therapy acquire no immunity to a fresh infection. P. G. M.

**Effect of extracts of various organs on homogeneous liquid cultures of *B. tuberculosis*.** F. ARLOING, L. THÉVENOT, and J. VIALIER (Compt. rend. Soc. Biol., 1937, **124**, 164—165).—Kidney- and liver-extracts depress the multiplication: those of lung assist the growth but the organisms are very short.

H. G. R.

**Effect of decreased atmospheric pressure and anaërobiosis on homogeneous liquid cultures of human *B. tuberculosis*.** F. ARLOING, L. THÉVENOT, and J. VIALIER (Compt. rend. Soc. Biol., 1937, **124**, 161—163).—Under reduced pressure or anaerobic conditions, the organism becomes longer and more granular, and the resistance to acid decreases.

H. G. R.

**Pentenyl-, hexenyl-, and heptenyl-resorcinols.**—See A., II, 98.

**New bacterial carotenoid, leprotin.** C. GRUNDMANN and Y. TAKEDA (Naturwiss., 1937, **25**, 27).—*Leprotin*, m.p. 198—200°, is obtained from bacteria isolated from infectious material from a leper. Its absorption spectrum is almost identical with that of  $\beta$ -carotene but it can be separated from the latter chromatographically. It gives a blue solution with  $\text{SbCl}_3$  in  $\text{CHCl}_3$ .

E. A. H. R.

**Leucotriphenylmethanes as reagents for bacterial polysaccharides.** G. H. CHAPMAN and C. W. LIEB (Stain Tech., 1937, **12**, 15—19).—Acid solutions of leucotriphenylmethane compounds and reduced bases of  $\text{CHPh}_3$  give ppts. or colour reactions with bacterial polysaccharides. Non-bacterial polysaccharides and simpler carbohydrates give no reaction.

E. M. W.

**Inhibiting action of univalent cations on the multiplication of a species of bacteriophage.** V. SERTIC (Compt. rend. Soc. Biol., 1937, **124**, 14—15).—For satisfactory multiplication of the phage, univalent cations must be a min.; their inhibiting action can be counteracted by the presence of bivalent cations.

H. G. R.

**Effect of electrolytes on the development of various strains of bacteriophage.** V. SERTIC (Compt. rend. Soc. Biol., 1937, **124**, 98—100).—The bacteriophages have been placed in five groups depending on their behaviour towards electrolytes.

H. G. R.

**Are viruses organisms or autocatalysts?** H. H. DIXON (Nature, 1937, **139**, 153).—The evidence summarised favours the view that viruses are autocatalytic substances.

L. S. T.

**Virucidal (rabies and poliomyelitis) activity of aqueous urea solutions.** E. M. McKAY and C. R. SCHROEDER (Proc. Soc. Exp. Biol. Med., 1936, **35**, 74—76).—A virus suspension containing 40% of urea is completely inactivated within 1 hr. The action is probably related to the ability of urea to denature protein.

P. G. M.

**Inactivation of tobacco mosaic virus by X-rays.** J. W. GOWEN and W. C. PRICE (Science, 1936, **84**, 536—537).—The virus is inactivated by exposure to X-rays from a Cu target having a characteristic K radiation of 1.537 Å. Survival ratios follow a simple curve with a slope of  $e^{-0.079t}$ , where  $t$  is the time of exposure in min.

L. S. T.

**Inactivation of tobacco virus by ascorbic acid.** M. LOJIKIN (Contr. Boyce Thompson Inst., 1936, **8**, 335).—Reduced ascorbic acid (I) inactivated purified preps. of tobacco mosaic virus, the process necessarily involving oxidation of (I) by atm.  $\text{O}_2$ . Cu catalyses the autoxidation of (I) and accelerates inactivation of virus. Oxidation of (I) by I, 2 : 6-dichlorophenol-indophenol, or  $\text{KMnO}_4$  does not result in inactivation of the virus. Dehydroascorbic acid does not inactivate the virus under conditions in which reduced (I) is effective. Tomatoes from healthy and diseased plants have the same vitamin-C content.

A. G. P.

**Relation between the activity of tobacco mosaic virus and  $p_H$  over the range  $p_H$  5—10.** R. J. BEST (Austral. J. Exp. Biol., 1936, **14**, 323—328).—Irreversible inactivation of the virus sets in at  $p_H$  7.8 and is almost complete at  $p_H$  10.2. The  $p_H$ -activity curve resembles the neutralisation curve of a weak acid. Between  $p_H$  8.0 and 8.9 the ratio  $[\text{H}^+]/\text{active virus concn.}$  is const. The inactivating effect is probably due to the neutralisation of acidic groups forming part of the prosthetic group of the virus.

E. A. H. R.

**Relationship of Stanley's crystalline tobacco-mosaic virus material to intracellular inclusions present in virus-infected cells.** H. P. BEALE (Contr. Boyce Thompson Inst., 1936, **8**, 333).—The inclusions treated on micro-slides with HCl ( $p_H$  1.3) yielded needle-shaped crystals apparently identical with those obtained by Stanley (A., 1935, 1181) by acidifying virus extracts. Healthy plant cells and those infected with ring-spot or potato X virus produced no crystals by this method.

A. G. P.

**Ultracentrifugal analysis of the crystalline virus proteins isolated from plants diseased with different strains of tobacco-mosaic virus.** R. W. G. WYCKOFF, J. BISCOE, and W. M. STANLEY (J. Biol. Chem., 1937, **117**, 57—71).—A series of ultracentrifugal analyses by both the absorption and the  $n$  methods has been made of solutions of the virus-proteins derived from plants infected with different strains of tobacco-mosaic virus. The sedimentation consts. of these proteins correspond with mols. of a wt. of several millions and are the same whether measured in the untreated juice of infected plants, in solutions of the cryst. centrifugate, or in the cryst. proteins isolated and purified by chemical methods. The juice of healthy plants always yields proteins of mol. wt. <30,000. The mol. wt. of the virus-proteins does not change over a  $p_H$  range of 2—9.3. Differences in sedimentation rate exist between the proteins of different strains. Virus-proteins from tobacco and phlox plants infected with the same strain give the same sedimentation const. Treatment of these proteins with  $\text{H}_2\text{O}_2$ ,  $\text{CH}_2\text{O}$ , or  $\text{HNO}_2$  did not disrupt the mol. Some of the proteins were molecularly homogeneous, some showed diffuse sedimentation boundaries, and others contained two well-defined mol. types.

P. W. C.

**Virus of tobacco mosaic. VIII. Isolation of a crystalline protein possessing the properties of aucuba-mosaic virus.** W. M. STANLEY (J. Biol.

Chem., 1937, **117**, 325—340).—The isolation of a cryst. protein (I), having the properties of aucubamosaic virus, from infected Turkish tobacco plants is described. (I) differs from tobacco-mosaic virus protein in that its crystals are larger, its solutions more opalescent, its isoelectric point ( $p_{\pi}$  3.7) is more alkaline, its solubility lower, and its sedimentation const. 20% greater. F. A. A.

**Antiseptic action of organic sulphur compounds on cultures of some pathogenic organisms.** A. MOREL, A. ROCHAIX, L. PERROT, and S. SANLAVILLE (Compt. rend. Soc. Biol., 1937, **124**, 188—190).—The antiseptic action of the allyl, Pr, and glycol derivatives studied was not significant. H. G. R.

**Effect of liquid air temperature on bacteria.** G. WINCHESTER and T. J. MURRAY (Proc. Soc. Exp. Biol. Med., 1936, **35**, 165—166).—Cultures of *B. typhi*, *B. coli*, *S. albus*, and *B. subtilis* survive immersion in liquid air for 1 week, and many saline suspensions of bacteria which survive the mechanical effects of freezing are still viable after 19 months at 83° abs. P. G. M.

**Effect of pressure on pathogenic organisms and their toxins, on viruses, bacteriophages, and malignant tumours.** J. BASSET, M. A. MACHEBŒUF, and E. WOLLMAN (Ann. Inst. Pasteur, 1937, **58**, 58—77; cf. A., 1936, 1291).—Animal cells and those of most neoplasms are killed by pressures of 1800 atm. Most invisible viruses, bacteriophages, and non-spore-bearing organisms are inactivated by pressures of 6000 atm., but toxins and enzymes may require 19,000 atm. for inactivation. Spores of *B. subtilis* are not killed even at 20,000 atm. pressure. The sp. anaphylactic activity of sera is modified by pressures of 4500 atm. P. G. M.

**Preparation of solid media using silica gel.** H. MÜNCH (Arch. Hyg. Bakt., 1936, **117**, 129).—SiO<sub>2</sub> gel, free from Na salts, mixed with phosphate-buffered broth can replace agar in tube and plate bacteriological technique. Such a medium served for the culture of various pathogens. W. L. D.

**Filter candles.** I. PERAGALLO (Ann. Inst. Pasteur, 1937, **58**, 48—57).—The optimum pore size is 15—20  $\mu$ ; with a pore size of 30  $\mu$  abs. sterility cannot be guaranteed. P. G. M.

**Influence of adrenaline on the concentration of Congo-red in the blood of the dog.** O. LAMBRET, G. BIZARD, and J. DRIESSENS (Compt. rend. Soc. Biol., 1937, **124**, 63—65).—Hypotension caused by intravenous administration of adrenaline is accompanied by a decrease in the vol. of circulating blood. H. G. R.

**Adrenaline content of adrenal capsules separated from the central nervous system.** H. HERMANN, F. JOURDAN, G. MORIN, and J. VIAL (Compt. rend. Soc. Biol., 1937, **124**, 169—171).—A decrease in the adrenaline content was observed. H. G. R.

**Hyperglycæmia in dogs produced by ligation of the portal vein. Effect of liver-glycogen and adrenalectomy.** N. FIESSINGER, R. CATTAN, and F. P. MERKLEN (Compt. rend. Soc. Biol., 1936, **123**, 1142—1146).—The increase in blood-sugar depends

essentially on the glycogen content of the liver and is not due to adrenaline. H. G. R.

**Ketosis following administration of adrenal cortex extract.** E. M. MCKAY and R. H. BARNES (Proc. Soc. Exp. Biol. Med., 1936, **35**, 177—180).—Large doses of cortical hormone increase the ketosis of fasting female more than of fasting male rats, and abolish the partial oxidation of  $\beta$ -hydroxybutyric acid. P. G. M.

**Blood-calcium in relation to anterior pituitary and sex hormones.** O. RIDDLE and L. B. DOTRI (Science, 1936, **84**, 557—559).—The gonad-stimulating hormone of the anterior pituitary increases serum-Ca in normal, hypophysectomised, or thyroidectomised, but not in castrated, pigeons. This action is apparently exerted on tissues producing sex hormone or related substance, and is obtained more quickly in females with intact ovaries than in males or in operated animals of either sex. Prolactin, cortin, and follicle-stimulating hormone-free "growth hormone" have no such action on blood-Ca. Dosage of female sex hormones, especially theelin, and to a smaller extent dihydrotheelin, theelol, and progesterone, increases serum-Ca in normal, hypophysectomised, and thyroidectomised pigeons and rats, and in normal doves, fowl, and dogs. Androstenediol, testosterone and its oxime have no such effect on blood-Ca. L. S. T.

**Thyrotropic hormone and specific dynamic action of proteins.** J. MAHAUX (Compt. rend. Soc. Biol., 1936, **123**, 1266—1267).—The sp. dynamic action of proteins in men is inhibited by injection of thyrotropic hormone of the anterior pituitary gland. H. G. R.

**Thyrotropic hormone in non-pituitary tissue.** D. A. MCGINTY and N. B. MCCULLOUGH (Proc. Soc. Exp. Biol. Med., 1936, **35**, 24—26).—Cow, sheep, and sow ovaries contain no thyrotropic hormone. P. G. M.

**Dependence of the biological action of sexual hormones on their structure.** I. REMESOV (J. Biochem. Japan, 1936, **24**, 113—126).—A theory is advanced of the sp. action of sterones depending on their structure and based on the function of certain "anchor" or "protector" groups to fix the mol. to the organism substrate, following which the mol. exerts its characteristic physiological action. The theory is especially exemplified by luteosterone. F. O. H.

**Diffusion of hormones. Folliculin.** D. S. ELEFThERIOU (Compt. rend. Soc. Biol., 1936, **123**, 1186—1188).—In addition to the selective absorption by the epithelium, the diffusibility of the hormone is slightly > that of the oil used as solvent. H. G. R.

**Selective passage of hormones across the uterine epithelium.** D. S. ELEFThERIOU (Compt. rend. Soc. Biol., 1936, **123**, 1184—1186).—The thyrotropic and gonad-stimulating hormones of the anterior lobe of the pituitary, injected into guinea-pigs, are selectively absorbed by the uterine epithelium. H. G. R.

**Production in vitro of oestrogenic substances.** (A) H. E. VOSS and E. RABALD. (B) P. RONDONI

(Z. physiol. Chem., 1936, 245, 76—77, 78—79).—(A) Cholesterol, even when purified by ordinary methods, contains oestrogenic substances. Hence the conclusions of Rondoni *et al.* (A., 1936, 1156) are untrustworthy.

(B) A reply.

W. McC.

Excretion of gonadotropic substances in the urine during pregnancy. J. S. L. BROWNE and E. M. VENNING (Lancet, 1936, 231, 1507—1511).—The curves now obtained for the excretion of these substances during pregnancy differ from those generally accepted.

L. S. T.

Oestrin in rat pregnancy urine. F. E. D'AMOUR, D. FUNK, and M. B. GLENDENNING (Proc. Soc. Exp. Biol. Med., 1936, 35, 26—27).—The urine, but not the placenta, of pregnant rats contains small amounts of oestrin.

P. G. M.

Isolation of pregnandiol from human pregnancy urine. D. BEALL (Biochem. J., 1937, 31, 35—40).—A method involving adsorption on BzOH at  $p_H$  2.5—2.0 is described. After adsorption combined pregnandiol (I) is liberated by hydrolysis with boiling 0.25*N*-HCl for 2 hr. and total (I) is separated by extraction with PhMe. (I) is destroyed on evaporation of the urine at 100° in an open vessel. Adsorbed (I) glycuronide cannot be isolated without the use of BuOH. Urinary filtrates after treatment with BzOH yield further small amounts of free and combined (I) on repetition of the adsorption and some allopregndiol.

W. McC.

17-iso- $\Delta^5$ -Pregnen-3-ol-20-one.—Sec A., II, 104.

Experimental induction of ovulation with progesterone. H. ZWARENSTEIN (Nature, 1937, 139, 112—113).—Progesterone induces ovulation in adult, immature normal, and hypophysectomised *Xenopus laevis*; it also has an ovulating effect on the excised ovaries.

L. S. T.

Gonadotropic antihormones. H. J. GREGERSON, A. R. CLARK, and R. KURZROK (Proc. Soc. Exp. Biol. Med., 1936, 35, 193—195).—Pregnancy urine antisera, after treatment with human serum-proteins, inhibit the gonadotropic action of both urinary and pituitary hormones; the inhibitory action is therefore due to a sp. antagonistic substance and is not merely an anti-human serum reaction.

P. G. M.

Colorimetric determination of sex hormones. II. W. ZIMMERMANN (Z. physiol. Chem., 1936, 245, 47—57; cf. A., 1935, 1032).—The hormone in abs. EtOH, *m*-C<sub>6</sub>H<sub>4</sub>(NO<sub>2</sub>)<sub>2</sub> in abs. EtOH (1%), and 3*N*-KOH (2:1:1 vols.) are mixed, 75% EtOH is added to replace the loss of vol. by contraction, and the colour is measured with a photometer after 1 hr. Allowance must be made for temp. changes and the determination carried out in diffused light or half-darkness. Tables of extinction coeffs. for androsterone, testosterone, oestrone (I), and creatinine and data for use in the determination of mixtures of the hormones in extracts of urine are given. The behaviour of equilin corresponds exactly with that of (I).

W. McC.

Effect of insulin on carbohydrate formation in the liver. S. J. BACH and E. G. HOLMES (Biochem.

J., 1937, 31, 89—100).—Slices of liver of starved rats form carbohydrate *in vitro* from non-carbohydrate. Addition of lactate (I), pyruvate (II), alanine (III), aspartic acid, glutamic acid, and arginine increases but of glycine decreases gluconeogenesis. Insulin (IV) *in vitro* inhibits 56% of this synthesis and simultaneously depresses urea formation by preventing deamination. Urea formation is increased in presence of (III) and this increase is inhibited by (IV). (IV) acts by inhibiting synthesis of carbohydrate from NH<sub>2</sub>-acids. (IV) has no effect on carbohydrate synthesis from (I) and (II).

P. W. C.

Effect of peripheral injection of insulin on the blood-sugar of a limb isolated from the general circulation. M. POLONOVSKI, G. BIZARD, H. WAREMBOURG, and P. LAMOUR (Compt. rend. Soc. Biol., 1937, 124, 77—78).—Injection of large quantities of insulin produces hypoglycaemia frequently preceded by intense hyperglycaemia.

H. G. R.

*In-vitro* action of insulin on the sugar content of blood in presence of various tissues. G. CAZZONE and G. LUPPENO (Arch. Farm. speriment., 1936, 62, 131—156).—Citratd whole blood (rabbit) treated *in vitro* with insulin (*e.g.*, 10 units per 10 c.c. of blood) diminishes slightly in sugar content (*e.g.*, from 0.110 to 0.092%) after 2—4 hr. at 37°. The diminution is increased by addition of pieces of tissue to an extent varying with different tissues and being greatest with heart and uterus and with blood of a high initial sugar content.

F. O. H.

Hypoglycaemic action of histone insulinate. A. BLASOTTI, V. DEULOFEU, and J. R. MENDIVE (Nature, 1936, 138, 1101).—A solution of thymus histone gives with a solution of cryst. insulin (I) at  $p_H$  7—7.2 a ppt. which contains most of (I) previously present in solution. When administered to normal or pancreatectomised dogs, the histone insulinate produces a hypoglycaemia more prolonged than that produced by (I) alone.

L. S. T.

Constitution of insulin. I. Properties of reduced insulin preparations. K. G. STERN and A. WHITE (J. Biol. Chem., 1937, 117, 95—110).—In native and fully active insulin (I) no free ·SH is detectable. When (I) is acted on by thioglycolic acid at  $p_H$  2, it is converted first into the reduced native form and then undergoes denaturation. The rate of appearance of free ·SH at this latter stage decreases. By combining chemical and physical methods, the point on the reduction curve is determined at which (I) exists more or less completely in the reduced native condition. Preps. isolated at this stage retain at least 50% of their physiological activity and contain 2—3 cysteine equivs. per mol. One or two ·S·S· linkings in (I) have therefore a special function.

P. W. C.

Calcium and iodine metabolism in thyroid disease. I. D. PUPPEL and G. M. CURTIS (Arch. Int. Med., 1936, 58, 957—977).—In a case of hypothyroidism there was an abnormally high retention and, in two cases of exophthalmic goitre, an abnormally high excretion of Ca. In one of the latter cases, the I balance was continuously negative even with a normally adequate I intake.

W. O. K.

**Biochemistry of fluorine. I. Antagonism between fluorine and thyroxine.** K. KRAFT (Z. physiol. Chem., 1936, 245, 58—64).—The effect of 0.015 mg. of thyroxine (I) on the development of tadpoles is counteracted by approx. 1 mg. of NaF, 2 mg. of  $\alpha$ -C<sub>6</sub>H<sub>4</sub>F·CO<sub>2</sub>H (which is very toxic), and 0.7 mg. of 3-fluorotyrosine (II). The I : F ratio in human blood is identical with that in the antagonistic amounts of (I) and (II). (II) does not affect fermentation by yeast or lactic acid production in frog's muscle.

W. McC.

**Chemistry of the lactogenic hormone extracts.** W. H. McSHAN and H. E. FRENCH (J. Biol. Chem., 1937, 117, 111—117).—The extracts (A., 1936, 902), prepared either by AcOH- or acid-COME<sub>2</sub>-extraction, are protein in nature, non-dialysable, and contain total N approx. 15, P 0.37, and S 1.5%. Changes in physiological activity on diazotisation, digestion with trypsin or pepsin, heating in acid or alkaline media, and the conditions conducive to stability are investigated.

P. W. C.

**Liver oil from *Dasyatis akiei*: vitamin contents, physical and chemical constants. Fish-liver oils and vitamins.**—See B., 1937, 59.

[Effect of] deficiency of vitamin-A and -B complex on concentration of blood and tissue enzymes of the albino rat. VI. B. SURE and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, 35, 210—211).—Simultaneous deficiency of vitamin-A and -B complex does not result in disturbance of serum enzyme concn. beyond that produced by -A and -B<sub>1</sub>.

P. G. M.

**Action of the vitamin-B complex on muscle respiration in experimental beriberi.** P. E. GALVAO and J. PEREIRA (Z. physiol. Chem., 1936, 245, 19—22).—The O<sub>2</sub> consumption of 1 mg. of the dry matter of the breast-muscle of healthy pigeons remains const. at 4.3—5.6 c.c. per hr., but that of the muscle of pigeons suffering from B-avitaminosis is usually much lower. When pigeons suffering from, or cured of, B-avitaminosis have not lost too much wt. or are able to use rice stored in the crop, the O<sub>2</sub> consumption of the muscle is normal. Vitamin-B does not cure beriberi by direct action on muscle metabolism.

W. McC.

**Assay, distribution, and properties of the filtrate factor.** T. H. JUKES (J. Biol. Chem., 1937, 117, 11—20).—A method for the assay of the filtrate factor (I) (the H<sub>2</sub>O-sol. vitamin belonging to the -B complex and preventing dermatitis in chicks) is described and a unit is proposed consisting of 0.1 of the optimal daily requirement of the chick. The distribution of (I) in foodstuffs is determined. (I) is sol. in 99.5% EtOH, is present in the phosphotungstic acid filtrate, is not destroyed by treatment with BzCl, and is readily extracted by H<sub>2</sub>O from certain foodstuffs. It does not prevent gizzard erosions in chicks and its distribution is different from that of the human anti-pellagra factor.

P. W. C.

**Fat metabolism in nervous tissue of B-avitaminotic pigeons.** Y. TAKATA (J. Biochem. Japan, 1936, 24, 153—205).—The polished rice used in the

diets contained 0.6% of total fatty acid (I) and 0.0075% of total cholesterol (II), and was free from lecithin and kephalin. Improved methods for the micro-determination of total (I) and (II), phosphatide-(III)-P, and lipid NH<sub>2</sub>-N in 0.1—0.5 g. of brain tissue are described. Starvation or B<sub>1</sub>- or B<sub>1</sub> B<sub>2</sub>-avitaminosis in pigeons diminishes the total (I) content of the brain but does not affect the level of total (II), (III)-P, or lipid NH<sub>2</sub>-N. Starvation does not significantly change any lipid constituent of the spinal cord or peripheral nerves whilst lack of vitamin-B<sub>1</sub> or -B<sub>1</sub> + -B<sub>2</sub> diminishes the content of total (I), the other lipids being unaffected. -B<sub>2</sub> enhances, whilst -B<sub>1</sub> inhibits, the oxidation of fats in nervous tissue; hence the metabolism of fats in nervous tissue may attain a state of equilibrium by the simultaneous action of -B<sub>1</sub> and -B<sub>2</sub>.

F. O. H.

**Bisulphite-binding capacity of the blood of pigeons with [vitamin-]B<sub>1</sub> deficiency.** S. DE JONG (Arch. Neerland. Physiol., 1936, 21, 465—475).—Bisulphite-binding substances (pyruvate) (I) are determined in 30-cu. mm. samples of blood from individual pigeons on -B<sub>1</sub>-deficient diets. The (I) content rises during attacks of acute polyneuritis. The clinical symptoms appear earlier, and disappear later (following vitamin-B<sub>1</sub> administration), than the rises in (I). Disturbance of the birds, and chronic polyneuritis, are not accompanied by rises in (I).

F. A. A.

**p<sub>H</sub> and buffering power of the brain of normal and B<sub>1</sub>-avitaminotic pigeons.** I. I. NITZESCU and I. D. GEORGESCU (Compt. rend. Soc. Biol., 1937, 124, 155—157).—A decrease in the p<sub>H</sub> and buffering power was observed in B<sub>1</sub>-avitaminosis.

H. G. R.

**Influence of lactic acid on the respiration of mammalian brain in B<sub>1</sub> avitaminosis.** P. E. GALVAO and J. PEREIRA (Biochem. Z., 1936, 289, 136—142).—In brain (cerebrum) of rats deprived of vitamin-B<sub>1</sub> and showing the symptoms of avitaminosis, lactate brings about little or no increase of O<sub>2</sub> utilisation, but in the cord and in the cerebrum of avitaminous rats in which symptoms have not developed, it has the same effect as in normal brain.

P. W. C.

**Hydrogenation of vitamin-B<sub>1</sub>.** F. LIPMANN (Nature, 1936, 138, 1097—1098).—Hydrogenation by Pt-black and reduction by NaHSO<sub>3</sub> are described. Reduction appears to take place at the double linking nearest to the quaternary N.

L. S. T.

**Differentiation of the growth-promoting factors in yeast which are related to rat pellagra.** F. J. GORTER (Arch. Neerland. Physiol., 1936, 21, 538—553).—Growth tests on rats show that the decomposed Pb(OAc)<sub>2</sub> ppt. from yeast extracts does not give complete vitamin-B<sub>2</sub> activity, as claimed by some workers. Optimal growth of rats is obtained only when the diet contains, besides a flavin concentrate or Pb(OAc)<sub>2</sub> ppt., a supplementary factor (-B<sub>3</sub>) and another factor present in yeast residue after extraction with H<sub>2</sub>O and aq. EtOH. This latter factor, as well as -B<sub>6</sub>, exerts anti-pellagic action.

F. A. A.

**Growth-promoting activity of lactoflavin administered orally and parenterally.** P. GYÖRGY

(Proc. Soc. Exp. Biol. Med., 1936, 35, 207—209).—The growth-promoting activity of lactoflavin (I) is unaffected by the method of administration. The rat-day dose is the same ( $7-10 \times 10^{-6}$  g.) for (I) and its phosphoric acid; phosphorylation is therefore a general cellular reaction. P. G. M.

**Determination of lactoflavin and vitamin- $B_6$  in cows' and human milk.** P. GYORGY (Proc. Soc. Exp. Biol. Med., 1936, 35, 204—207).—The "rat-day dose" of lactoflavin (I) is the min. quantity required to produce an increase in wt. of 10 g. per week for 4 weeks, and of vitamin- $B_6$  the quantity that caused healing of the sp. dermatitis. The  $-B_6$  content of cows' and human milk is similar (5 c.c. = 1 rat-day dose), whilst the (I) content of cows' milk (5 c.c. = 1 rat-day dose) is three times that of human milk. P. G. M.

**Origin of vitamin-C. Experimental evidence supporting Sah's hypothesis.** P. P. T. SAH (J. Chinese Chem. Soc., 1936, 4, 457—462).—Evidence supporting Sah's theory (A., 1934, 707) is collected. R. S. C.

**Reduced ascorbic acid content of blood-plasma.** L. D. GREENBERG, J. F. RINEHART, and N. M. PHATAK (Proc. Soc. Exp. Biol. Med., 1936, 35, 135—139).—Reduced ascorbic acid in the plasma parallels the vitamin-C intake. The optimal plasma level of -C is  $>0.9$  mg. per 100 c.c. P. G. M.

**Ascorbic acid in the pituitary gland.** A. GIROUD, R. RATSIMAMANGA, M. RABINOWICZ, and H. CHALOPIN (Compt. rend. Soc. Biol., 1937, 124, 41—42).—During C-avitaminosis, the rate of decrease of ascorbic acid in the pituitary gland is  $<$  that in other organs. H. G. R.

**Variation of reducing power (vitamin-C) of human saliva with age.** D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1937, 124, 103—104).—Vitamin-C in the saliva increases during the period of growth and then becomes const. H. G. R.

**Vitamin-C in saliva of children with infectious diseases.** D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1937, 124, 104—105).—A decrease was observed in all cases, indicating an increased utilisation by the organism. H. G. R.

**Anti-anaphylactic power of ascorbic acid in guinea-pigs: effect of the diet and ascorbic acid content on the sensitivity of the organism.** A. GIROUD, P. GIROUD, R. RATSIMAMANGA, and M. RABINOWICZ (Compt. rend. Soc. Biol., 1936, 123, 1146—1148).—As with the rabbit, ascorbic acid in the diet reduces the susceptibility to anaphylactic shock. H. G. R.

**Avitaminosis-C and the platinum potential of the aqueous humour and crystallin. Influence of the basal diet.** N. BEZSSONOFF, J. NORDMANN, and P. REISS (Compt. rend. Soc. Biol., 1936, 123, 1196—1198).—An increase of 60 mv. in the aq. humour and of 40 mv. in the crystallin (A., 1935, 377) occurs during avitaminosis-C in guinea-pigs. H. G. R.

**Intramuscular injection of ascorbic acid and excretion in sweat.** A. LILIENFELD, I. S. WRIGHT, and E. MACLEATHEN (Proc. Soc. Exp. Biol. Med.,

1936, 35, 184—189).—Ascorbic acid is metabolised by the body following intramuscular injection, and the max. level in blood is reached more slowly and maintained longer than after intravenous injection. P. G. M.

**Effect of vitamin-C administration on vitamin-C of milk and urine of lactating mothers.** F. T. CHU and C. SUNG (Proc. Soc. Exp. Biol. Med., 1936, 35, 171—172).—Once saturation is reached 60% of the vitamin-C administered is excreted in the urine. Changes in the -C content of milk are slower and steadier; after saturation (0.08 mg. per c.c.) is reached the concn. may remain high for 10 days after cessation of administration. P. G. M.

**Autoxidation of ascorbic acid and its inhibition by sulphur compounds.** J. C. GHOSH and P. C. RAKSHIT (Biochem. Z., 1936, 289, 15—26).—The mechanism of the protective action of -SH and -S-S substances on the autoxidation of ascorbic acid (I) is investigated, as is also the catalytic effect of  $\text{Cu}^+$  and  $\text{Cu}^{++}$ . Autoxidation occurs when mols. of (I) react with activated, dissolved  $\text{O}_2$  and protective action results when  $\text{O}_2$  is inactivated by formation of mol. complexes with the S compounds. P. W. C.

**Oxidation of ascorbic acid and its reduction *in vitro* and *in vivo*.**—See A., II, 86.

**Source of vitamin-D in summer milk.** J. E. CAMPION, K. M. HENRY, S. K. KON, and J. MACKINTOSH (Biochem. J., 1937, 31, 81—88).—The vitamin-D contents of milk and butter from cows kept on summer and winter rations, some indoors and others outdoors, are determined. Direct exposure of the cow to sun and sky-shine contributes the whole, and the pasture none, of the increase in -D potency of milk which takes place in summer time. P. W. C.

**Mode of action of vitamin-D. II. Influence on the faecal output of endogenous calcium and phosphorus in the rat. III. Influence on the absorption of calcium and phosphorus in the rat.** R. NICOLAYSEN (Biochem. J., 1937, 31, 107—121, 122—129).—II. The faecal output of Ca in Ca and P starvation is 1—5 mg. daily in vitamin-D-deficient rats and 0.25—1.35 mg. in normal rats. The output of Ca in Ca starvation is unaffected by ingestion of inorg.  $\text{PO}_4$ , Na glycerophosphate, acid-extracted meat powder, or caseinogen. The output of P in Ca and P starvation is 1.0—2.1 mg. daily in -D-deficient rats and 0.75—1.35 in normal rats. The output of P in P starvation is increased both in normal and -D-deficient rats by ingestion of Ca.

III. In P starvation, absorption of 15, 45, and 90 mg. of Ca in -D-deficient rats was 50, 36, and 28% and was 100, 57, and 47% in rats receiving 50 international units of -D daily. In Ca starvation, absorption of combined P of acid-extracted meat powder is equally impaired in both normal and -D-deficient rats, whilst absorption of P from inorg. P, glycerophosphate, and caseinogen is complete in both types of rat. It appears, therefore, that the action of -D in the rat's gut is confined to direct action on absorption of Ca, the reduced absorption of P being due to pptn. by the increased amount of Ca in the bowel. P. W. C.

**Influence of the calcium and phosphate ratio and contents of the basal diet on the vitamin-D requirements of chicks.** M. J. L. DOLS (Arch. Néerland. Physiol., 1936, 21, 554—561).—X-Ray data and bone analyses of chicks, maintained from 1 day old on diets of similar base excess, but differing in Ca and P content and Ca : P ratios, show that the lower limit for P is about 0.45%; increasing the P content to 0.6 and 1.0% decreases the vitamin-D necessary to prevent rickets. The influence of the Ca : P ratio is less definite. Chicks on diets containing 1% of P, and Ca : P = 3 : 1, but no -D, can be maintained up to 5 weeks without showing rickets (leg weakness). The data are compared with similar data for the rat (Querido, A., 1935, 1431), for which the min. P content is lower (0.12—0.2%). F. A. A.

**Effect of vitamin-D deficiency on concentration of blood- and tissue-enzymes of the albino rat.** V. B. SURE, M. C. KIK, and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, 35, 209—210).—Experimental rickets differs from human rickets in that the large increase in the concn. of serum-phosphatase recorded for the latter does not occur. P. G. M.

**Concentration of vitamin-K.** H. DAM and L. LEWIS (Biochem. J., 1937, 31, 17—21).—An oil containing 200,000 units of vitamin-K per g. was obtained from dried lucerne. Distillation of this oil in a high vac. gave N-free material containing 700,000 units of -K per g. -K exhibits no characteristic absorption of ultra-violet light, resists treatment with  $\text{Ac}_2\text{O}$  at 100° for 30 min., is found in the non-ketone fraction on treatment with Girard's reagent, and is destroyed by adsorption on  $\text{Al}_2\text{O}_3$ ,  $\text{MgO}$ , or burned gypsum. -K is possibly an ester. W. McC.

**Vitamin-K requirement of animals.** H. DAM, F. SCHÖNHEYDER, and L. LEWIS (Biochem. J., 1937, 31, 22—27).—A diet deficient in vitamin-K produces hæmorrhagic disease in ducklings and young geese as well as in chicks but affects pigeons and canaries only slightly or very slowly and does not affect rats, guinea-pigs, or dogs. Man and some animals may not require -K or it may be synthesised in their bodies. The clotting power of the blood of a hæmophilic man was only slightly improved by giving 700,000 units of -K in the course of 9 days. W. McC.

**Factor  $L_2$ , a second dietary factor for lactation.** W. NAKAHARA, F. INUKAI, and S. UGAMI (Proc. Imp. Acad. Tokyo, 1936, 12, 289—291).—Rats fed on a diet deficient in factor  $L$  (cf. A., 1934, 317) do not lactate when  $L_1$  (the factor  $L$  described in A., 1934, 930) and an acid earth adsorbate of yeast extract are incorporated in the diet. If yeast is substituted for the adsorbate, lactation is possible. An attempt is made to concentrate  $L_2$  from yeast extracts. J. L. D.

**Effects of current flow on bioelectric potential.** III. *Nitella*. L. R. BLINKS (J. Gen. Physiol., 1936, 20, 229—265).—The bioelectric phenomena accompanying the passage of inward and outward currents across the membrane of *Nitella* cells, leading, with outward currents, to stimulation with  $1\text{--}2 \times 10^{-6}$  amp. per sq. cm., are fully described. Recovery from stimulation is complete in 10—15 sec., but the

threshold for further stimulation is raised for longer periods. KCl inhibits recovery from stimulation. F. A. A.

**Stimulation of growth of soya-bean seeds by soft X-rays.** T. P. LONG and H. KERSTEN (Plant Physiol., 1936, 11, 615—621).—A slight stimulation is recorded. A. G. P.

**Relation of temperature and time to carbon dioxide production and growth in continuously aerated malt-agar cultures of *Polystictus versicolor*.** T. C. SCHEFFER (Plant Physiol., 1936, 11, 535—564).—The rate of  $\text{CO}_2$  production by cultures of the fungus increased steadily with time at all temp. examined. The rate of increase became slightly greater with rising temp. to 29.5°.  $\text{CO}_2$  production per unit mycelial area was min. at 25—29°. A. G. P.

**Comparative effects of altering leaf temperatures and air humidities on vapour pressure gradients.** O. F. CURTIS (Plant Physiol., 1936, 11, 595—603).—The temp. gradient between leaf and air is an important factor controlling rates of transpiration. Increased transpiration following a rise in atm. temp. is due solely to the rise in leaf temp. A. G. P.

**Growth of *Chlorella vulgaris* in pure culture.** W. H. PEARSALL and L. LOOSE (Proc. Roy. Soc., 1936, B, 121, 451—501).—In media containing a limited proportion of glucose, growth of *C. vulgaris* proceeds at first exponentially until approx. 6000 cells per cu. mm. are produced. Subsequently the rate slackens until the cell nos. reach 25,000—30,000, when further cell division is replaced by cell extension. These changes are associated with increases in chlorophyll and starch contents and in wall thickness. Metabolism alters from a course involving chiefly protein and protoplasmic synthesis to one dominated by accumulation of carbohydrate and wall-forming substance. After growth ceases there is a general hydrolysis of insol. substances and cultures become yellow. There is a close resemblance between the development and maturation of algae cells and the corresponding stages in cells of higher plants. A. G. P.

**Effect of light and of ethylene chlorohydrin on the citric acid content of *Bryophyllum* leaves.** J. D. GUTHRIE (Contr. Boyce Thompson Inst., 1936, 8, 283—288).—The citric acid (I) content of the leaves increases 5-fold during the night and represents approx. 25% of the diurnal change in acidity. Exposure to  $\text{CH}_3\text{Cl}\cdot\text{CH}_2\cdot\text{OH}$  vapour increases the  $p_H$  and decreases titratable and total acid and the (I) content of leaves, (I) under these conditions representing approx. 50% of the change in acidity. The acid metabolism of *Bryophyllum* involves (I) as well as malic acid. A. G. P.

**Salt accumulation by [plant] roots.** D. R. HOAGLAND and T. C. BROYER (Plant Physiol., 1936, 11, 471—507).—A close relation exists between the salt accumulation of excised barley roots and active aerobic respiration of the root cells. Adequate supplies of  $\text{O}_2$  are necessary for accumulation of both anions and cations. Temp. effects are considerable. K salts accumulate rapidly in root saps against the

concn. gradient. Factors influencing experimental results are discussed and the bearing of data obtained is considered in relation to root pressure, translocation of salts, and root-cell metabolism. A. G. P.

**Features of the [plant] root system relative to salt absorption.** P. PREVOT and F. C. STEWARD (Plant Physiol., 1936, **11**, 509—534).—In barley roots grown in  $H_2O$  cultures, the salt-absorbing zone extends from the apex to the point at which secondary roots appear, its activity being controlled by factors influencing the cortical cells. Absorption, judged by concn. of accumulated salts, is greatest at the apex and declines with distance therefrom. Time-absorption curves are recorded and discussed. A. G. P.

**Exchange of phosphorus atoms in plants and seeds.** G. HEVESY, K. LINDERSTROM-LANG, and C. OLSEN (Nature, 1937, **139**, 149—150; cf. A., 1936, 257).—By growing sunflower plants with lower leaves already developed in nutrients containing radioactive P, a considerable migration of P occurs from lower to upper leaves during subsequent growth. The bulk of the P, presumably as inorg. P, moves about in the plant, but none escapes when cut leaves are placed in a nutritive solution. Germinating maize and pea seeds take up radioactive P in the germ but not in the endosperm, showing that there is no P exchange between them. L. S. T.

**Action of aqueous medium on the nitrogen and phosphorus nutrition of a herbaceous plant.** M. T. GERTRUDE (Compt. rend., 1936, **203**, 1091—1093).—Plants of *Veronica anagallis*, grown under  $H_2O$ , utilise N and synthesise protein more rapidly than when kept in the air. They also show a more rapid increase in P-containing constituents. W. O. K.

**Availability of nitrous nitrogen to plants. Physiological ontogeny in plants and its relation to nutrition.** I, II.—See B., 1937, 70.

**Respiration and metabolism in etiolated wheat seedlings as influenced by phosphorus nutrition.** W. W. JONES (Plant Physiol., 1936, **11**, 565—582).—Presence of  $PO_4^{'''}$  in nutrients increased the  $CO_2$  production of germinating seeds, whether these were obtained from normal or P-deficient plants. Plants grown in complete nutrients contained more insol. and less sol. N, less reducing sugars, and more sol. and insol. P than those grown with P-deficient media. No starch or sucrose appeared in roots or tops of wheat seedlings irrespective of the P supply. P influences respiration (i) by association with carbohydrates to form a substrate suitable for respiratory enzymes and (ii) by limiting protein synthesis. A. G. P.

**Transpiration [of plants] as modified by potassium.** A. G. SNOW, jun. (Plant Physiol., 1936, **11**, 583—594).—Deficiency of K in nutrient media decreases the rate of transpiration (after an initial period), the effect being relatively greater in tobacco than in sunflower plants. The change is still more if Na is used to replace K in the nutrient. A. G. P.

**Germination of maize embryos outside the grain and in presence of fructofuranose polyoses.**

G. DRAGONE-TESTI (Atti R. Accad. Lincei, 1936, [vi], **24**, 31—34).—The growth of the embryos in a salt nutrient solution (A., 1934, 1418) is enhanced by addition of 1% of fructose, raffinose, inulin, and, to a smaller extent, sucrose and glucose. The growth, however, is still subnormal, probably due to absence of growth hormones. F. O. H.

**Permanganates and plant growth.** M. E. WEBSTER and I. M. ROBERTSON (Nature, 1937, **139**, 71).—With *Opuntia leucotricha*  $MnO_4$  is more effective than  $Mn^{++}$  although both produce marked increases in growth. Absorption of Mn from  $Mn^{++}$  is > from  $MnO_4$ . L. S. T.

**Growth-substance content of seeds of different ages.** N. NIELSEN (Compt. rend. Trav. Lab. Carlsberg, 1936, Ser. physiol., **21**, 427—436).—Barley seeds are rich in the hormone stimulating yeast growth and in that stimulating *Aspergillus niger*. Seeds 14 years old have the same hormone content as current year's seed. The germinative ability of seed is unrelated to the growth-substance. A. G. P.

**Deseeded *Avena* test method for small amounts of auxin and auxin precursors.** F. SKOOG (J. Gen. Physiol., 1937, **20**, 311—334).—Sensitivity of decapitated *Avena* seedlings as test material for auxin (I) is increased by previous removal of seed to prevent regeneration of (I) in the material itself. The test can then be prolonged to allow more complete absorption of the applied (I) and the response is more delicate through the nature of growth in the new physiological conditions. The method is applied to study distribution of (I) and (I) precursors, the presence of which in the applied agar blocks is inferred from a delayed reaction in the test seedling. The reaction is also produced by known precursors of hetero-auxin (viz., tryptophan, indolyl-pyruvic acid and -ethylamine). R. M. M. O.

**Synthetic plant growth hormones.**—See A., II, 112.

**Artificial production of inulin in Compositæ.** H. COLIN (Compt. rend., 1936, **203**, 1280—1282).—After burying a long dahlia stem for 4 months the content of inulin in the buried part increased considerably. A similar result was obtained by earthing up a dahlia plant without the covered part taking root or shooting. J. N. A.

**Carbohydrate nutrition of the corolla (of *Lilium croceum*).** R. COMBES (Compt. rend., 1936, **203**, 1282—1284; cf. A., 1935, 1037).—During growth, the corolla accumulates sol. carbohydrates, holosides, and heterosides in amounts which increase rapidly a few days before and decrease immediately after blooming. The dried petals contain approx. half their wt. of sol. carbohydrate. J. N. A.

**Toxicity of mercury vapour to germinating tobacco seeds.** R. R. KINCAID (Plant Physiol., 1936, **11**, 654—656).—Exposure of seed to Hg vapour lowered the % germination. Twice washing with conc.  $HNO_3$  restored normal germination capacity. The injurious effect  $\propto$  the area of Hg exposed. A. G. P.

"Pelagosite" as a new type of calcareous alga.—See A., I, 156.

**Nutritive value of the papaya.** C. D. MILLER and R. C. ROBBINS (Biochem. J., 1937, 31, 1—11).—Ripe papayas grown in Hawaii contain: acid (as citric) 0.13, H<sub>2</sub>O 85.6, protein 0.5, Et<sub>2</sub>O extract 0.3, crude fibre 0.8, carbohydrate (by difference) 12.3, ash 0.51, Ca 0.019, P 0.013, Fe 0.00025, and Cl 0.132%; 100 g. of the edible material contain, on the average, 70 mg. of vitamin-C, 2500 international units of -A, and 8 of -B<sub>1</sub>, and 33 Bourquin-Sherman units of -B<sub>2</sub>. The -C content increases with ripeness.

W. McC.

**Isolation of citric acid from potato tubers.** J. D. GUTHRIE (Contr. Boyce Thompson Inst., 1936, 8, 295—296).—The method of isolation is described (cf. Miller *et al.*, A., 1936, 1034).

A. G. P.

**Xylyl-β-D-glucoside.**—See A., II, 87.

**Soma-Haoma, the holy plant of India and Persia.** L. VAN ITALLIE (Natuurwetensch. Tijds., 1937, 19, 9—11).—The red sap from *Sarcostemma acidum*, R., contains malic acid, small amounts of sucrose and reducing sugars, and traces of tannins, phytosterol, m.p. 142°, glucosides, and alkaloids.

S. C.

**Lipins of Connecticut shade-grown tobacco seed.** L. F. SALISBURY (J. Biol. Chem., 1937, 117, 21—25).—The seed contains 35.8% of lipins, extractable by COMe<sub>2</sub> and EtOH-Et<sub>2</sub>O and consisting principally of triglycerides with 0.15% of sitosterol and 0.07% of phospholipin. The fatty acids obtained from the glycerides contained palmitic (9.8), stearic (I) (5.9), oleic (28), and linoleic acid (56.3%) together with small amounts of solid acids of mol. wt. > that of (I).

P. W. C.

**Seed wax of *Simmondsia Californica*.** T. G. GREEN, T. P. HILDITCH, and W. J. STAINSBY (J.C.S., 1936, 1750—1755).—The wax (46%) obtained by light petroleum extraction of the seeds consists principally of the esters of Δ<sup>8</sup>-eicosenoic acid (I) (and possibly a little docosenoic acid) and Δ<sup>8</sup>-docosenyl and Δ<sup>8</sup>-eicosenyl (?) alcohols in approx. equal proportions. Oxidation (alkaline KMnO<sub>4</sub>) of (I) affords κλ-dihydroxyeicosanoic acid, m.p. 130.5°. F. N. W.

**Determination of nucleic phosphorus in horse-beans (*Vicia faba minor*).** T. LITYNSKI (Bull. Acad. Polonaise, 1936, B, 103—129).—Pre-extraction of horse-beans with 100 times their wt. of 0.1% aq. NaOH, followed by pptn. of the nucleic compounds (I) with HCl (to make 3—4%), enables the nucleic compound P and the total P to be determined. Variations from this procedure result in incomplete extraction, adsorption of other P compounds on the ppt., or decomp. of the (I). The total P, as P<sub>2</sub>O<sub>5</sub>, extracted by NaOH represents about 1.35% of the bean, and includes 0.15% of nucleic P and 0.16% of inorg. P.

F. A. A.

**Hazel-nut oil. Non-fatty oil [liquid wax] from Jojoba seed.**—See B., 1937, 59.

**Occurrence of a heptose in some species of Polish *Sedum*.** L. M. PRONER (Wiadom. farm., 1935, 62, 742—748; Chem. Zentr., 1936, i, 2355).—A

ketoheptose forming an osazone, m.p. 197—198°, [α]<sub>D</sub> +5.12°, identical with sedoheptosazone (La Forge and Hudson, A., 1917, i, 444) is isolated from *S. acre*, L., *S. reflexum*, L., and *S. boloniense*, Loisl. A no. of reactions are described.

H. N. R.

**Odorous constituents of *Matsutake*.** I. S. MURAHASHI (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1936, 30, 263—271).—The Et<sub>2</sub>O extract of *Armillaria Matsutake*, Ito et Imai, yields *trans*-CHPh.CH·CO<sub>2</sub>Me (I) [which has the characteristic odour], an oil [not resembling (I) in odour], and *matsutake alcohol* (II), C<sub>8</sub>H<sub>15</sub>·OH, b.p. 165—173°, [α]<sub>D</sub> -7.82° in CHCl<sub>3</sub> [4'-iododiphenylurethane, m.p. 165.5—166°; odour different from that of (I)]. (II) is a sec.-octenol and gives (H<sub>2</sub>-PtO<sub>2</sub>) an octenol (4'-iododiphenylurethane, m.p. 158.5—159.3°). (I) contains also aldehydes, HCO<sub>2</sub>H, AcOH, fumaric (much), succinic (little), ? citric, oleic (much), palmitic, stearic, linoleic, and cinnamic acids.

R. S. C.

**Shonanic acid from the wood of *Libocedrus formosana*, Florin.**—See A., II, 108.

**Essential oil of green tea. VIII. Linalool and acetophenone.**—See A., II, 82.

**The yaje.** O. DE A. COSTA and L. FARIA (Rev. Assoc. Brasil Farm., 1936, 17, 265—309).—The microscopy of the plant and the isolation of yajecine (A., 1925, i, 828) are described. The plant contains a saponin and inulin.

L. A. O'N.

**Protein of purified *Panicum Crus-galli*, L., var. *frumentaceum*, Hook f.** T. OHARA (J. Agric. Chem. Soc. Japan, 1937, 13, 6—10).—This material is recommended as a possible substitute for rice, to which it is much superior in respect both of total N content and of individual NH<sub>2</sub>-acids of nutritional importance.

R. M. M. O.

**Pigment of *Kerria japonica*, DC.** T. ITO, H. SUGINOME, K. UENO, and S. WATANAKE (Bull. Chem. Soc. Japan, 1936, 11, 770—774).—The dried petals (44.9 kg.) of this flower yield to COMe<sub>2</sub> a wax (0.2 g.), m.p. 88—89°, which, when hydrolysed, gives lutein, palmitic acid, and a little oleic acid. The absorption spectrum of the wax is identical with that of lutein dipalmitate. Neither the wax nor a similar synthetic mixture could be separated chromatographically, though the presence of a small amount of another dye (? taraxanthin) in the wax is indicated. The possible mixed nature of other natural dye waxes is discussed (cf. A., 1936, 395).

R. S. C.

**Anthraquinone pigments in *Galium*.** R. HILL and D. RICHTER (Proc. Roy. Soc., 1937, B, 121, 547—560).—The distribution of purpurin-3-carboxylic acid (I) and alizarin (determined by a method using their absorption spectra in PhMe) was determined in various species of *Galieæ*. Extracts of the roots yielded ruberythric acid, rubiadin (II), asperuloside, and galiosin. The primverosides of (I) and (II) occur in *Galium* and *Rubia*, hydroxyanthraquinone glycosides from which are hydrolysed by enzymes (e.g., erythrozym) present in species of *Primula* (cf. A., II, 7, 87).

F. O. H.

**Colouring matter of red cabbage.**—See A., II, 71.

Reversible oxidation and reduction of chlorophyll.—See A., II, 122.

Alkaloids of *Senecio*.—See A., II, 127.

Corlumine and corluminine.—See A., II, 80.

Curarine from calabash curare.—See A., II, 127.

Constituent of *Zanthoxylum frazineum*, Wild.—See A., II, 112.

Mu-fang-chi.—See A., II, 127.

Basic fuchsin suitable for the Feulgen technique. J. T. SCANLAN and C. G. MELIN (Stain Tech., 1937, 12, 1—8).—Purification with  $\text{SO}_2$  improves basic fuchsin for the Feulgen technique. Pararosaniline chloride and acetate (prep. described) have good staining and decolorising properties.

E. M. W.

Dioxan technique for triple staining. F. A. WATERMAN (Stain Tech., 1937, 12, 21—23).—Modifications of Castroviejo's and Mallory's triple staining methods are described.

E. M. W.

Histological staining process with the colouring matter of *Sambucus ebulus*, L. P. FOURMENT and H. ROQUES (Bull. Trav. Soc. Pharm. Bordeaux, 1935, 73, 194—200; Chem. Zentr., 1936, i, 2153).—This material (prep. described) can replace brazilin and hæmatoxylin.

H. N. R.

Emulsification of fat for intravenous administration. R. J. MYERS and H. BLUMBERG (Proc. Soc. Exp. Biol. Med., 1936, 35, 79—84).—Supersonic radiation is the best method for preparing stable fat emulsions, and can be used after sterilisation.

P. G. M.

Latent impurities in electrodes used for spectrographic research. D. A. WEBB (Nature, 1937, 139, 248).—Impurities in C or graphite electrodes may be mistaken for constituents of the specimen under investigation even when a blank spectrum of the arc is used as control, owing to the marked intensification of the spectrum of impurities produced by any mixture resembling tissue-ash. Reports on the distribution in living tissues of V, Ti, Cu, and possibly other elements must be regarded with reserve when C or graphite electrodes have been used.

L. S. T.

Spectrographic analysis of biological material. II. Bismuth. J. CHOLAK (Ind. Eng. Chem. [Anal.], 1937, 9, 26—27; cf. A., 1935, 1552).—With the procedure described, 0.00004 mg. of Bi can be detected and 0.001—3.00 mg. determined with an average error of  $\pm 10\%$ .

E. S. H.

Micro-method of gas analysis adapted for biological studies. M. H. SEEVERS and R. T. STORMONT (Ind. Eng. Chem. [Anal.], 1937, 9, 39—42).—Apparatus and procedure for sampling and for transportation of samples are described.

E. S. H.

Determination of proteins in solution. M. BICK (Austral. J. Exp. Biol., 1936, 14, 305—306).—Proteins at their isoelectric point, when heated at  $100^\circ$  for 30 min. with 0.5%  $\text{CH}_2\text{O}$ , in the presence of 0.2%  $(\text{NH}_4)_2\text{SO}_4$  (in absence of other electrolytes) are completely denatured and may be determined by weighing the coagulum.

E. A. H. R.

Photometric determination of bilirubin. L. JENDRASSIK and R. A. CLEGHORN (Biochem. Z., 1936, 289, 1—14).—A method is described for determination of bilirubin (I) in serum by step photometer in which caffeine, NaOBz, and NaOAc catalyse its conversion into azobilirubin (II). Protein pptn. must be avoided since the ppt. adsorbs (II). The method gives additive vals. for serum + (I) solutions and gives vals. > those usually accepted. P. W. C.

Stability and determination of phosphatides. E. B. MAN (J. Biol. Chem., 1937, 117, 183—187; cf. Page *et al.*, A., 1936, 92).—If the  $\text{EtOH-Et}_2\text{O}$  extract is evaporated under reduced pressure at  $> 37^\circ$  in  $\text{N}_2$ , 95—100% of the  $\text{EtOH-Et}_2\text{O}$ -sol. P of human blood-serum is also sol. in light petroleum. Hence the phosphatide content of serum is given by determinations of this P.

W. McC.

Determination of amino-nitrogen by Van Slyke's method. A. B. KENDRICK and M. E. HANKE (J. Biol. Chem., 1937, 117, 161—174).—Van Slyke's manometric method for determining  $\text{NH}_2\text{-N}$  yields theoretical results with cystine (I) and glycine (II) as well as with other  $\text{NH}_2$ -acids (not tryptophan) if KI is added to the reaction mixture. The trustworthiness of the method is increased by using a modified Hempel pipette or, better, by carrying out the whole operation in the apparatus of Harington and Van Slyke (A., 1924, ii, 872). With blood-filtrates (after correction for urea) the amount of  $\text{N}_2$  obtained by the method is 8—15% < that by Van Slyke's method. Hence blood probably contains (I), (II), or substances which behave like these in Van Slyke's method.

W. McC.

Determination of bases in animal tissues. E. STRACK and H. SCHWANEBERG (Z. physiol. Chem., 1936, 245, 11—18).—Use is made of the differing solubilities of the reineckates of the bases (choline, carnitine, betaine) to effect separation. The separated bases are determined gravimetrically or volumetrically by Beattie's method (A., 1936, 1235). Carnitine reineckate (+ $\text{H}_2\text{O}$ ) has m.p.  $146\text{--}147^\circ$  (Ac derivative, m.p.  $154^\circ$ ; Me ester, m.p.  $136^\circ$ ; Et ester, m.p.  $135^\circ$ ) and betaine reineckate has m.p.  $154^\circ$  (Me ester, m.p.  $158^\circ$ ; Et ester, m.p.  $145^\circ$ ). Isolation of the bases as Au salts gives untrustworthy results.

W. McC.

Use of concentrated hydrogen peroxide in determining mineral compounds in vegetable and animal substances. W. VORBRÖDT (Bull. Acad. Polonaise, 1936, B, 139—153).—A process of "wet ashing," involving boiling with 30%  $\text{H}_2\text{O}_2$ , followed by treatment (in some cases) with  $\text{HNO}_3$ , is described.

F. A. A.

Photoelectric determination of phosphorus.—See A., I, 148.

Micro-determination of zinc [in plant materials]. Comparison of spectrographic and chemical methods. L. H. ROGERS and O. E. GALL (Ind. Eng. Chem. [Anal.], 1937, 9, 42—44).—The spectroscopic method has no advantage over iodometric titration.

E. S. H.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

APRIL, 1937.

**Effects of pulmonary gas embolism.** I. SINGH (J. Physiol., 1936, 87, 11—22).— $O_2$  consumption falls during temporary embolism, but rises and then returns to normal when vascular compensation occurs;  $O_2$  debt occurs during blockage and is subsequently repaid. Metabolism rises by about 5%. Relief of embolic asphyxia and disordered respiration with adrenaline is often counteracted by the increase produced thereby in metabolic rate. R. N. C.

**Use of helium as a therapeutic gas.** A. L. BARACH (Anesthesia and Analgesia, 1935, 14, 210—215).—Mice were unaffected by substitution of He for  $N_2$  in normal atm. proportions. Use of He in respiratory obstruction is considered.

CH. ABS. (p)  
**Analeptic respiratory action of theophylline-ethylenediamine complex.** J. VAN HEERSWYN-GHELS (Compt. rend. Soc. Biol., 1937, 124, 285—287).—The complex ("euphyllin") stimulates respiration, the effect being > the additive effects of the constituents. H. G. R.

**Which isomeride of coproporphyrin is eliminated during blood [pigment] decomposition?** H. T. SCHREUS (Klin. Woch., 1935, 14, 1717—1718; Chem. Zentr., 1936, i, 1904; cf. A., 1936, 501).—Coproporphyrin III is obtained from urine of patients under salvarsan treatment. A. G. P.

**Detection of porphyrin in blood-serum.** J. T. BRUGSCH (Münch. med. Woch., 1935, 82, 1803; Chem. Zentr., 1936, i, 2156).—Applications of a fluorescence technique are discussed. H. N. R.

**Oxygen transport of the foetal and maternal blood during pregnancy.** R. G. LEIBSON, I. I. LIKHNITZKY, and M. G. SAX (J. Physiol., 1936, 87, 97—112).—The area of variation of the  $O_2$  dissociation curve of the blood of a healthy woman is narrow. The curve is displaced slightly to the right in pregnancy, possibly through fall of  $p_H$ , whilst the curve of the foetal blood lies to the left of the normal adult curve, from which it differs in shape. The mean % of saturation of foetal blood is about 15% > that of the adult blood at the same  $p_H$  and  $O_2$  pressure, apparently through the presence of a different type of haemoglobin in the former; under the same conditions  $O_2$  saturation in maternal blood is about 6% > in non-pregnancy blood. These variations of  $O_2$ -carrying power partly compensate the displacement of the  $O_2$  dissociation curve to the right during pregnancy. R. N. C.

**Freezing and resuscitation of animals.** M. T. ZAROTSCHEV (Ice and Refrig., 1935, 89, 133—

134).—The blood of cold-blooded animals has high  $CO_2$  and  $COMe_2$  contents. Under conditions in which blood of warm-blooded animals contains these substances in appropriate proportions the temp. of the animals can be lowered without causing death.

CH. ABS. (p)  
**Changes in composition of the blood of the turtle following complete anoxia.** F. B. MORELAND (J. Biol. Chem., 1937, 117, 471—479; cf. A., 1934, 93).—Administration of  $Na_2CO_3$  or  $NaHCO_3$  to turtles during anoxia increases blood-lactate and lowers blood-sugar by relieving acidosis. Acidosis alone from rebreathing  $CO_2$  does not produce hyperglycemia. The  $CO_2$  set free in anoxia corresponds with that displaced by lactic acid. No significant formation of  $AcCHO$  or  $AcCO_2H$  occurs. The effect of  $CN'$  on blood-sugar and -lactate is > that of  $O_2$  deprivation. Depletion of glycogen during anoxia occurs mainly in the heart. R. M. M. O.

**Acclimatisation of the human subject to atmospheres containing low concentrations of carbon monoxide.** E. M. KILLICK (J. Physiol., 1936, 87, 41—55).—Acclimatisation occurs to a considerable degree. Haemoglobin, the red cell count, and the  $O_2/CO$  distribution coeff. of whole blood outside the body are unaltered in acclimatisation. R. N. C.

**Histamine and leucocytosis.** V. H. MOON, M. M. LIEBER, and P. J. KENNEDY (Arch. Path., 1935, 20, 209—215).—Injection of histamine (I) phosphate increases the no. of polymorphonuclear leucocytes in blood. Release of (I) from cells in areas of extensive injury is a factor in evoking the subsequent leucocytosis. CH. ABS. (p)

**Solvent water in the mammalian erythrocyte.** J. MACLEOD and E. PONDER (J. Physiol., 1936, 86, 147—152).—The distribution of  $(CH_2OH)_2$  between human, rabbit, ox, and sheep erythrocytes and the surrounding fluid shows that the cell- $H_2O$  is virtually all solvent  $H_2O$ . R. N. C.

**Action of salts of fatty acids on erythrocytes and bacteria.** H. O. HETTCHE (Z. Immunitats., 1935, 83, 506—511; Chem. Zentr., 1936, i, 2381).—The haemolytic activity of fatty acids increases with the no. of C atoms and with the no. of double linkings. Haemolysis was most rapid with linolenic acid. Salts of fatty acids are bactericidal only to Gram-positive organisms. The relative toxicity of the acids follows the same order as their haemolytic activity.

A. G. P.  
**Formation of ammonia in avian erythrocytes and cell respiration.** V. A. ENGELHARDT and A. A. BAEV (Biochimia, 1936, 1, 113—133).—The

corpuscles liberate  $\text{NH}_3$  under anaerobic conditions (replacement of  $\text{O}_2$  by  $\text{CO}_2$  or  $\text{N}_2$ , or addition of phenylurethane or KCN). The ratio of labile P to formed  $\text{NH}_3$  is not const., suggesting that sources of  $\text{NH}_3$  other than adenosinetriphosphoric acid exist. The process of  $\text{NH}_3$  liberation is irreversible, and cannot be inhibited by phospho-glyceric or -pyruvic acid, as is the case for muscle cells. It is concluded that rephosphorylation in avian erythrocytes is associated with an oxidative rather than a glycolytic process.

R. T.

**Preservation of human and sheep erythrocytes in naphthalenedisulphonate solution.** H. GOLDIE (Compt. rend. Soc. Biol., 1937, 124, 206—208).—The optimum concns. and  $p_{\text{H}}$  of 1:6- $\text{C}_{10}\text{H}_8(\text{SO}_3\text{Na})_2$  for preservation of human and sheep erythrocytes are 1–2% and 0.75%, and 6.2–6.4 and 6.8, respectively.

H. G. R.

**Bilirubin of blood and bile. Application of electrophoresis and of the ultracentrifuge.** K. O. PEDERSEN and J. WALDENSTROM (Z. physiol. Chem., 1937, 245, 152—162).—The sedimentation const. of bilirubin (I) (whether in the form which can be diazotised directly or in that which can be diazotised only after treatment with EtOH) is approx. equal to those of serum-albumin (II) and hæmoglobin and its isoelectric point is  $p_{\text{H}}$  4.8 approx. Aq. (I) combines with (II) but not with ovalbumin. Hence (I) occurs in blood combined with (II) and probably does not circulate free in the organism. In bile (I) occurs combined with a carrier of high mol. wt. which increases its solubility.

W. McC.

**Dispersion of hæmoglobin.** P. LAMBERT and J. FAUTREZ (Protoplasma, 1936, 25, 220—233).—Nistler's method gave 21 Å. for the radius of hæmoglobin particles in 1.7% solution. In concns. >2.3% and at  $p_{\text{H}}$  <3 and >8.5 and near the isoelectric point ( $p_{\text{H}}$  6.8—7.4) particles of different sizes were present.

M. A. B.

**Resistance of hæmoglobin.** I. Physico-chemical. II. Chemical. III. Experiments with animals. Y. AZUMA (J. Chosen Med. Assoc., 1935, 25, 489—511).—The resistance is measured by the time required for the disappearance of the  $\alpha$ -band after treating laked blood with acid or alkali. Bases are less active than mineral acids in this respect. Effectiveness of acids is in the order  $\text{AcOH} < \text{HCl} < \text{H}_2\text{SO}_4 < \text{HNO}_3$ . Resistance of different bloods was in the order human < dog < mouse < rabbit < chicken < pig < sheep < goat < cattle. In anæmia and hyperleucocytosis vals. were normal.

CH. ABS. (p)

**Chlorophyll and hæmoglobin regeneration after hæmorrhage.** J. H. HUGHES and A. L. LATNER (J. Physiol., 1936, 86, 388—395).—Chlorophyll (I) in very small, but not in large, doses accelerates hæmoglobin regeneration in rabbits after hæmorrhage. Crude (I) or its Mg-free derivatives accelerate regeneration in large doses.

R. N. C.

**Oxygen dissociation curves and osmotic pressures of hæmoglobins of different species.** E. F. MCCARTHY (J. Physiol., 1936, 86, 77—82).—The  $\text{O}_2$  dissociation curves of hæmoglobins from a no. of

species show marked differences. The osmotic pressures are all of the same order except that of rabbit hæmoglobin, which is slightly > the average val.

R. N. C.

**Storage of carbon particles in the reticulo-endothelial system and hæmoglobin formation.** T. RADEFF (Biochem. Z., 1937, 289, 211—216).—A single injection intravenously or intraperitoneally of Indian ink into mice, rats, or rabbits does not increase blood-hæmoglobin or the no. of red cells, neither does it inhibit the formation of hæmoglobin or red cells. The absorption of such colloidal particles of C by the liver and spleen does not affect their Fe content.

P. W. C.

**Distribution of hæmoglobin and its derivatives in the tissues of *Phyllodoce mucosa*.** C. RAPHAEL (Compt. rend. Soc. Biol., 1937, 124, 347—349).—Hæmoglobin has been identified in the dorsal cirrus, base of the parapodia, and skin.

H. G. R.

**Relation between the hæmoglobin content of the blood and the blood groups.** A. GARGIULO (Compt. rend. Soc. Biol., 1937, 124, 501—502).—No correlation was observed.

H. G. R.

**Preparation of hæmoglobin in a dry and active state.** D. B. MORRISON and A. HISEY (J. Biol. Chem., 1937, 117, 693—706).—The prep. of reduced hæmoglobin (I) in a dried and stable condition without significant loss of  $\text{O}_2$ -capacity and the properties of such preps. are described. More difficulty was experienced in obtaining high activities with dog (I) than with ox, pig, or human (I) when the  $\text{O}_2$ -activating factor was not excluded at crit. stages of prep. and dissolution of samples. Dog (I) is the most readily cryst., is slower to dissolve after drying, and yields more methæmoglobin (II). Rapid drying of reduced (I) and oxyhæmoglobin greatly accelerates (II) formation. In the dried state, reduced (I) may be preserved indefinitely in a vac. without change in activity.

P. W. C.

**Hæmoglobin determination by hæmatocrit. (Indirect hæmoglobin determination.)** H. SCHARTUM-HANSEN (Folia hæmatol., 1935, 54, 22—26; Chem. Zentr., 1936, i, 1926—1927).—The vol. of erythrocytes  $\propto$  hæmoglobin content.

H. N. R.

**Micro-spectrophotometric examination of the absorption spectra of oxyhæmoglobin of vertebrates.** T. TUCHOLSKI and A. WOLOSZCZUK (Acta phys. polon., 1934, 3, 271—278; Chem. Zentr., 1936, i, 2582).—Absorption spectra of hæmoglobin from man, guinea-pig, and frog are identical. A new band at 492—519 m $\mu$  (max. 510 m $\mu$ ) is recorded.

A. G. P.

**Carbamate equilibrium. II. Equilibrium of oxy- and reduced hæmoglobin.** W. C. STADIE and H. O'BRIEN (J. Biol. Chem., 1937, 117, 439—470; cf. A., 1936, 289).—That  $\text{CO}_2$  forms with hæmoglobin a carbamate analogous to those of the  $\text{NH}_2$ -acids is indicated by the rates of formation and the thermal relations being the same; the  $\text{CO}_2$  combines directly with the protein amphanion and not with the zwitterion. Mass action equilibria developed on this basis support new and published experimental data.

R. M. M. O.

**Titration curves of oxygenated and reduced hæmoglobin.** B. GERMAN and J. WYMAN, jun. (J. Biol. Chem., 1937, 117, 533—550).—Titration curves of oxy- (I) and reduced hæmoglobin (II), determined directly with a glass electrode, show that between  $p_H$  4.5 and 6.08—6.15 (II) is the stronger acid, and over the  $p_H$  range 6.08—6.15 to about 8.9 (I) is the stronger. Ionic strength of the solutions has little effect on this relationship. Equations relating  $p_H$  with  $O_2$ -affinity are deduced. F. A. A.

**Methæmoglobin containing fluorine, and its significance for the determination of fluorine in industrial hygiene.** R. FABRE and S. BAZILLE (XIV Congr. Chim. ind. Paris 1934, 1935, 1, 5 pp.; Chem. Zentr., 1936, i, 2399).—The F-methæmoglobin may be detected spectroscopically in presence of 10 parts of oxyhæmoglobin by its absorption band at 610 m $\mu$ . 0.1—2 mg. of NaF may be so determined by measurement of the extinction coeff. J. S. A.

**Colour values of acid hæmatin solutions.** G. BARKAN and J. OLESK (Biochem. Z., 1937, 289, 251—265).—Acid hæmatin solutions from blood and erythrocyte suspensions of the same hæmoglobin (I) content show characteristic differences in their colour vals. determined photometrically, and colorimetrically. Numerous factors (time, temp., concn., etc.) influence the degree of dispersion and therefore the colour vals. and it is doubtful whether the (I) content can be inferred from them. P. W. C.

**Chemiluminescence of hæmin and the recognition of forensically important blood traces.** W. SPECHT (Angew. Chem., 1937, 50, 155—157).—The solution consists of about 0.1 g. of 3-amino-phthalhydrazide (I), 5 g. of  $Na_2CO_3$ , 15 c.c. of 3%  $H_2O_2$ , and 100 c.c. of  $H_2O$ , or 0.1 g. of (I) in 100 c.c. of 0.5% aq.  $Na_2O_2$ ; to the first solution a trace of indazolone-4-carboxylic acid is added. Fresh blood causes only a feeble luminosity whereas dried blood stains give a bright blue, persistent chemiluminescence the intensity of which increases with the age of the stain. The reaction is sp. for blood. H. W.

**Physical state of globin and mol. wt. of methæmoglobin obtained by reaction of protohæmatin with globin.** J. ROCHE and R. COMBETTE (Compt. rend., 1937, 204, 70—72).—A solution of a globin (I) with protohæmatin at  $p_H$  8 affords ferroporphyrin, denatured globin, and methæmoglobin (II). (II) obtained in this way, or by the action of  $K_3Fe(CN)_6$  on blood, has a mol. wt. of about 66,000, which indicates that the reaction has broken up the aggregates of (I) (cf. A., 1933, 174). J. L. D.

**Electrophoresis of serum-globulin.** I. A. TISELIUS (Biochem. J., 1937, 31, 313—317; cf. Reiner, A., 1928, 192; Pedersen, A., 1933, 674).—The isoelectric point of the globulin (I) (horse, rabbit) is  $p_H$  5.2. The heterogeneity of (I) is marked, especially at high  $p_H$ . W. McC.

**Rapid determination of the serine-globulin ratio in blood-serum.** J. A. LABAT (Bull. trav. Soc. Pharm. Bordeaux, 1935, 73, 172—174; Chem. Zentr., 1936, i, 2155).—Total protein is nephelometrically determined with  $CCl_3CO_2H$  and serine by

a similar process after pptn. of the globulin with  $MgSO_4$ . H. N. R.

**Alcoholysis of serum-albumin in autoclaves.** V. S. SADIKOV and V. A. VADOVA (Biochimia, 1936, 1, 218—244).—The loss of N due to volatilisation amounts to 15% for serum-albumin heated at 180° (6 hr.) with  $H_2O$  or MeOH, and to 10% with EtOH. 27% of the total N is recovered as  $NH_2$ -groups with  $H_2O$ , 22% with EtOH, and 8.8% with MeOH; the corresponding vals. for amide-N are 25, 2, and 14%, and for cyclopeptide- +  $(NH_2)_2$ -acid-N 48, 76, and 78%, respectively. cycloPeptides (including cyclo-leucylsvaline) are isolated from the alcoholysates by extraction with  $Et_2O$  or  $CHCl_3$ . R. T.

**Blood-serum and muscle-plasma of the fœtus.** C. ACHARD and M. PIETTRE (Compt. rend., 1937, 204, 24—27).—Myxoprotein in fœtal blood diminishes, whereas globulin and albumin slightly increase, as the fœtus grows. The  $p_H$  of striped muscle decreases and its glycogen content is < that of the liver. J. L. D.

**Effect of formaldehyde on the heat-denaturation of proteins.** A. FISCHER (Enzymologia, 1937, 1, 353—358).—The denaturation of highly purified serum-globulin is inhibited by low concns. of  $CH_2O$  (I). The inhibiting effect is greatest at the commencement of reaction and then decreases rapidly, due to the increasing no. of radicals formed with which (I) must combine to inhibit denaturation. Inhibition is more marked if (I) is added at the beginning of the process. Small amounts of (I) react with more  $NH_2$ -groups in the denatured than in the true protein. E. A. H. R.

**Phase-rule study of proteins of blood serum : comparison of proteins of human, rat, and horse serum.** E. JAMESON and D. B. ROBERTS (J. Gen. Physiol., 1937, 20, 475—489).—In salting out serum-proteins with increasing concns. of K citrate (I), breaks in the curve relating composition of liquid and concn. of (I) indicate four successive solid phases. There are sex and species differences in the proportions of the phases, and the concn. at which each begins to separate. All the solid matter is probably hydrated. R. M. M. O.

(A) **Blood-amino-acids in surgery.** A. J. BENGOLEA, C. V. SUAREZ, and R. S. FERRACINI. (B) **Amino-acid contents of blood cells and plasma : relation to surgical operations.** R. S. FERRACINI (Rev. med.-quir. patol. fem., 1935, 6, 245—260, 261—265).—(A) Lesions of the liver are accompanied by increased aminoacidæmia. Major operations cause a temporary increase, which is attributed to tissue destruction.

(B) Operations were followed by changes (increase or decrease) in the ratio cell-/plasma- $NH_2$ -acids. In all cases total  $NH_2$ -acids in blood increased.

CH. ABS. (p)

**Tyrosine index of the blood-polypeptides in the normal dog, horse, and pig.** F. LIÉGEOIS (Compt. rend. Soc. Biol., 1937, 124, 569—571).—The average vals. for the blood-polypeptides were 21, 14, and 23.6 mg. per kg., respectively. H. G. R.

**Tyrosine index of the blood-polypeptides in cancerous dogs.** F. LIÉGEOIS and P. TÉRACHE

(Compt. rend. Soc. Biol., 1937, 124, 571—572).—A normal val. is observed unless the tumour is accompanied by cellular proteolysis, when it is increased. H. G. R.

**Tyrosine index of the blood-polypeptides of dogs with trauma.** F. LIEGEOIS and P. TÉRACHE (Compt. rend. Soc. Biol., 1937, 124, 572—573).—Hyperpolypeptidæmia was observed. H. G. R.

**Interrelation of blood-lipins.** E. M. BOYD (Canad. J. Res., 1937, 15, D, 1—23).—Variations (within the normal range) in the total lipins (I) of blood-plasma were paralleled by those of neutral fats (II), phospholipins (III), cholesterol (IV), and (IV) esters. In lipæmia the initial change in plasma is a rapid increase in (II). (IV) esters increased at a later stage. Increases (in normal ranges) of the total (I) of red cells are due to increases in (III). Higher (II) contents may occur if the total (I) become > normal, in which condition changes in cellular (I) were unrelated to plasma-(I). Similar changes occur in white cells although the total (I) content of these was > that of red cells or plasma. A. G. P.

**Effect of pregnancy and pseudo-pregnancy on the blood-lipins of rabbits.** E. M. BOYD (J. Physiol., 1936, 86, 250—257).—Serum-lipins are all reduced in pseudo-pregnancy. In the first half of pregnancy, phospholipins and free cholesterol (I) are decreased, esterified (I) increased, and neutral fat is unchanged; all fall in the second half. The lipins of the erythrocytes are unaffected by pregnancy or pseudo-pregnancy, and are of the same order as in man. R. N. C.

**Composition of ether-extractable and ether-non-extractable lipins in blood-serum.** K. LEE and J. S. CHEN (Chinese J. Physiol., 1937, 11, 1—6).—Sheep's serum is extracted with Et<sub>2</sub>O and then with Et<sub>2</sub>O-EtOH mixture, and the I val., cholesterol, phosphatides, fatty acids, N, and P are determined for each fraction. The results suggest that the lipins insol. in Et<sub>2</sub>O may be bound to protein, the complex undergoing fission with EtOH. E. M. W.

**Effect of anticoagulants on blood-lipins.** E. M. BOYD and R. B. MURRAY (J. Biol. Chem., 1937, 117, 629—638).—The lipin vals. of heparinised, hirudinised, and defibrinated blood were unaffected by the concn. of anticoagulant or by keeping at 0°. K<sub>2</sub>C<sub>2</sub>O<sub>4</sub> and other anticoagulant salts caused an initial increase in red-cell-lipins, returning to normal after 1 day; the reverse was true for plasma. P. G. M.

**Blood-cholesterol in rabbits in relation to atherosclerosis.** K. B. TURNER and E. H. BIDWELL (J. Exp. Med., 1935, 62, 721—732; cf. A., 1933, 1321). The effects of KI and of dried thyroid on hypercholesterolaemia produced by feeding cholesterol are compared. CH. ABS. (p)

**Influence of sodium glycocholate on the enzymic synthesis and hydrolysis of cholesteryl esters in blood-serum.** W. M. SPERRY and V. A. STOYANOFF (J. Biol. Chem., 1937, 117, 525—532).—Na glycocholate (I) inhibits esterification of free cholesterol (II) in serum (man, dog). In human sera, with 0.2% of (I), inhibition is complete and the ratio free/combined (II) remains unaltered by larger

amounts of (I). In dogs' sera, addition of (I) beyond this point causes hydrolysis of esterified (II), which is complete with about 0.35% of (I). The reactions are enzymic. F. A. A.

**Enzymes of blood-serum. I. Esterase.** N. SUGIYAMA (Sei-i-Kwai Med. J., 1935, 54, No. 1, 63—78).—Esterase content (determined on tributyrin substrate) of Japanese males was max. at age 36—40 and min. at 16—20. In females, max. was reached at 21—25. CH. ABS. (p)

**Technique of blood-diastase determination by Ottenstein's method.** F. RENNKAMP and B. SCHULER (Klin. Woch., 1935, 14, 1760; Chem. Zentr., 1936, i, 2156).—Presence of diastase in the glycogen prep. used may vitiate the results.

H. N. R.  
**Reaction of fatty materials of blood with acetic anhydride and sulphuric acid.** W. RADSMÅ (Acta Brev. neerl. Physiol., 1935, 5, 67—69; Chem. Zentr., 1936, i, 1926).—Only linolenic, linoleic, and, possibly, oleic acids interfere with the colorimetric determination of cholesterol by this reaction. H. N. R.

**Lipin content of rabbit's leucocytes.** E. M. BOYD and J. W. STEVENSON (J. Biol. Chem., 1937, 117, 491—500).—Data for the contents (average vals. and standard deviations) of lipin constituents are tabulated and compared with corresponding vals. for human leucocytes. R. M. M. O.

**Determination of blood-urea by enzymic action and direct nesslerisation.** A. E. RAICES (Rev. med. quir. patol. fem., 1935, 5, 531—540).—The sample is treated with tungstic acid and the filtrate, suitably buffered, is decomposed by urease and the NH<sub>3</sub> produced is determined by Nessler's reagent. The urease prep. is purified by shaking with NH<sub>3</sub>-free permutit in presence of H<sub>2</sub>SO<sub>4</sub>. CH. ABS. (p)

**Colorimetric determination of blood-urea.** V. I. KRIEGER (Med. J. Australia, 1935, 2, 340—343).—Patterson's method (A., 1925, i, 1200) gives satisfactory results. Its efficiency is impaired in cold, damp weather. CH. ABS. (p)

**Significance of the diazo-reaction of blood.** G. BARAC (Compt. rend. Soc. Biol., 1937, 124, 266—269).—Normal blood contains only a small quantity of phenolic substances (0.5—1 mg. per litre), the greater part of the diazo-val. being due to non-volatile substances. When the glyoxalines are removed from the tungstate filtrate of blood with permutit, the diazo-val. is const. H. G. R.

**Determination of indican in blood.** M. ROSENBERG (Bol. Assoc. brasil. Pharm., 1935, 16, 276—278; Chem. Zentr., 1936, i, 2399).—The sensitivity of the Jolles reaction is 0.0032 mg. of indican. J. S. A.

**Alcoholism. I. Alcohol content of blood and spinal fluid following oral administration in chronic alcoholism and psychoses.** R. FLEMING and E. STOTZ (Arch. Neurol. Psychiat., 1935, 33, 492—506).—Following oral administration of EtOH the blood-EtOH increased more rapidly and to a higher max. in drinkers than in abstainers. Vals. for moderate drinkers were intermediate. In spinal fluid changes were similar except that vals. for moderate

drinkers were lowest. Vals for EtOH psychoses were similar to those of heavy drinkers and those for schizophrenics approached those for abstainers.

CH. ABS. (p)

**Micro-determination of alcohol in blood and other biological fluids.** R. CERNATESCU and I. ORNSTEIN (Compt. rend. Soc. Biol., 1937, **124**, 389—391).—The method of Nicloux (A., 1935, 116) is recommended and may be applied to material after storage. In normal cases, EtOH is distributed equally between the body-fluids.

H. G. R.

**Determination of cyclopropane, ethylene, and nitrous oxide in blood with the Van Slyke-Neill manometric apparatus.** F. S. ORCUTT and R. M. WATERS (J. Biol. Chem., 1937, **117**, 509—515).—The method (Orcutt and SeEVERS, A., I, 202) is applied to the determination of the solubilities of cyclopropane (I),  $C_2H_4$ , and  $N_2O$  in blood, and vals. are tabulated for the determination of these gases, and of  $O_2$  and  $CO_2$ , in blood (e.g., during anaesthesia).  $C_2H_4$ , though less sol., is more quickly reabsorbed by blood than are (I) and  $N_2O$ .

F. A. A.

**Lactation and blood-sugar.** J. L. Y DEAL (Lait, 1937, **17**, 113—121).—The blood-sugar (I) of 10 nursing mothers was 51—130 mg. per 100 c.c. No correlation existed between (I) level and stage of lactation, the changes at different stages being slight but variable. At max. milk yield the (I) content was 66—87 mg. per 100 c.c.

W. L. D.

**Fructosæmia in hepatic disturbances.** P. DE LUCIA and E. CLAAR (Minerva med., 1935, II, 345—350).—Ingestion of fructose produced a transitory fructosæmia in normal patients but a greater and more prolonged effect in cases of altered hepatic function.

CH. ABS. (p)

**Semi-micro-determination of blood-sugar.** F. MORENO MARTIN and E. SUÁREZ PEREGRIN (Anal. Fis. Quím., 1936, **34**, 842—849).—Glucose in blood coagulated with NaF is oxidised by a cuprammonium reagent and the Cu is oxidised by  $Fe^{+++}$  (in  $H_2SO_4$ ), the  $Fe^{++}$  formed being titrated to  $KMnO_4$  with  $NHPh_2$  as indicator. The results agree with those given by the Hagedorn-Jensen and the picramic acid methods.

F. R. G.

**Blood-sugar method based on ferricyanide-indigocarmine titration.** J. PATTERSON (Biochem. J., 1937, **31**, 244—247).—A method is described for rapid duplicate determinations on a single 0.2 ml. of blood of the sugar content by means of indigocarmine titration of  $K_3Fe(CN)_6$  reduced. The results agree with those by the MacLean method.  $H_2WO_4$  may be used for pptn. of proteins in place of  $Zn(OH)_2$ , but the results are somewhat higher, corresponding more closely with those by the Folin-Wu method.

P. W. C.

**Blood glycolysis and phosphoglyceric acid.** S. RAPOPORT (Biochem. Z., 1937, **289**, 290—291).—Phosphoglyceric acid (I) on incubation with whole blood is not attacked even in presence of added sugar and  $PO_4'''$  when esterification of  $PO_4'''$  is proceeding rapidly, but it is attacked on incubating with defibrinated blood, 40% of the total org.  $PO_4'''$  [including 56% of the (I)- $PO_4'''$ ] being hydrolysed in 20 hr.

With washed erythrocytes suspended in saline, the reaction proceeds further, 75% of the total org.  $PO_4'''$  [including 55% of the (I)- $PO_4'''$ ] being hydrolysed. Haemolysed blood attacks other forms of org.  $PO_4'''$  but does not attack (I) and converts diphosphoglyceric acid into (I). Defibrinated blood containing NaF does not attack (I) but on addition also of  $AcCO_2H$  effects synthesis of (I) as does also haemolysed blood + NaF.

P. W. C.

**Changes in silicic acid content of human blood, in health and in tuberculosis, following administration of lipin-soluble Siligran.** F. GAUBATZ (Klin. Woch., 1935, **14**, 1753—1755; Chem. Zentr., 1936, i, 2770).—Prolonged dosage with Siligran (ethylsilicyl ricinoleate) increases blood- $SiO_2$ , especially in tuberculosis.

A. G. P.

**Determination of the erythrocyte-plasma chloride ratio.** M. PAGET (J. Pharm. Chim., 1937, [viii], **25**, 103—107).—The erythrocytes and plasma are separated by centrifuging, and the former washed with isotonic aq. glucose. After suitable dilution, the proteins are pptd. with  $K_4Fe(CN)_6$  and  $Zn(OAc)_2$  and  $Cl^-$  in the clear filtrate is determined by addition of  $HNO_3$ , and excess of  $AgNO_3$  followed by titration with  $NH_4CNS$ .

W. O. K.

**Micro-colorimetric determination of chlorides in blood and urine.** T. V. LETONOFF (J. Lab. Clin. Med., 1935, **20**, 1293—1296).—The sample (0.1 c.c. of serum, plasma, or spinal fluid) is treated with Zn borate and filtered. Excess of  $AgCrO_4$  is added to the filtrate and the mixture is stirred and centrifuged. To the clear liquid are added  $AcOH$  and *s*-diphenylcarbazine. The colour produced is compared with that obtained with standard NaCl similarly treated with  $AgCrO_4$ . Urine is diluted, 1 in 40, and 2-c.c. samples are taken for the test.

CH. ABS. (p)

**Method of ashing plasma and whole blood for determination of chlorides.** W. E. WILKINS and H. D. JONES (J. Biol. Chem., 1937, **117**, 481—484).—Blood mixed with  $AgNO_3$ ,  $HNO_3$ , and  $Mg(NO_3)_2$  is ashed in presence of  $Cl^-$ -free asbestos, the residue being extracted with dil.  $HNO_3$  for  $Cl^-$  determination.

R. M. M. O.

**Distribution of bromide in blood-serum and spinal fluid.** F. F. SMITH, M. E. DAILEY, and D. H. SLOAN (Arch. Neurol. Psychiat., 1935, **33**, 764—774).—Vals. obtained by the Hauptman and the Toxopeus methods differed from those by the  $AuCl_3$  method.

CH. ABS. (p)

**Blood-bromine in the psychoses.** T. J. HENELLY and E. D. YATES (J. Mental Sci., 1935, **81**, 173—183).—Normal vals. were 0.6—2.0 mg. per 100 g. in males, with wider variations at the lower vals. in females. No correlation with mental state or the psychoses was apparent.

CH. ABS. (p)

**Iodine contents of blood of rabbits fed exclusively on polished rice.** K. ABO (Sei-i-Kwai Med. J., 1935, **54**, No. 1, 1—26).—In rabbits blood-I undergoes a seasonal variation similar to that in man. Vals. are paralleled by the severity of disease, and decline after administration of vitamin-B unless the severity is such that vitamin therapy is ineffective.

CH. ABS. (p)

Blood-calcium level in relation to the action of the thymus and of irradiated ergosterol. M. MESSINI (Boll. Soc. ital. Biol. speriment., 1932, 7, 945—947; Chem. Zentr., 1936, i, 2581).—The action of irradiated ergosterol in increasing blood-Ca is nullified in dogs by removal of the thymus. A. G. P.

Blood-potassium and the sympathetic-adrenaline-hepatic mechanism. B. A. HOUSSAY, A. D. MARENZI, and R. GERSCHMANN (Compt. rend. Soc. Biol., 1937, 124, 383—384).—Stimulation of the splanchnic nerves (dog) increases blood-K both on account of adrenaline secretion and direct stimulation of the liver. Stimulation of the distal ends of the hepatic nerves, after adrenalectomy, increases blood-K. The liver is the source of any increase in blood-K, the muscles being incapable of causing any variation. H. G. R.

Exchange of sodium, potassium, and calcium between erythrocytes and plasma. Content of these elements in blood-plasma and -serum. (A) H. WAELSCH. (B) G. M. STREEF (Z. physiol. Chem., 1937, 245, 89—92, 92).—(A) Differences between the author's results (A., 1935, 1142) and those of Streef (A., 1936, 1284) are due to differences in experimental conditions.

(B) A reply.

W. McC.

Investigation of the oligolytic saline concentration in blood by the changes in diameter of the erythrocytes. Z. NISYAMA (Keijo J. Med., 1936, 7, 477—506).—The diameter of erythrocytes in man, ox, and rabbit is reduced in aq. NaCl at low concn. As the concn. increases, the size of the erythrocytes decreases until a certain vol. is reached, after which there is a gradual increase in diameter to normal vals. The diameter and vol. are least in saline solutions of oligolytic concn. A. L.

Osmotic pressure and saline content of the blood of *Petromyzon fluviatilis*. T. McL. GALLOWAY (J. Exp. Biol., 1933, 10, 313—316).—On placing the lamprey in dil. (1 in 3) sea-H<sub>2</sub>O the osmotic pressure of the blood increases to the equiv. of 0.886% NaCl. Subsequent immersion in fresh H<sub>2</sub>O causes recovery of the lamprey and the return to normal osmotic pressure. CH. ABS. (p)

Determination of the alkaline reserve of normal and scorbutic guinea-pigs. L. RANDOIN, A. RAFFY, and J. AGUIRREZABALA (Compt. rend. Soc. Biol., 1937, 124, 621—623).—The val. is normal in scorbutic guinea-pigs until the onset of diarrhoea with hæmorrhage (after 24 days), when it increases by approx. 100%. H. G. R.

Determination of the alkali reserve of the blood with the Mook micro-apparatus. I. VAN DER HAL (Nederl. Tijds. Geneesk., 1936, 139—141; Chem. Zentr., 1936, i, 2786).—The apparatus is described. H. J. E.

Effect of water intake on human reactions to reduced cooling powers. R. A. GREGORY and D. H. K. LEE (J. Physiol., 1936, 86, 204—218).—Serum-protein and hæmoglobin concn. in the blood are increased if H<sub>2</sub>O is not administered, and the H<sub>2</sub>O/protein ratio of the serum also tends to fall during exposure to heat. Blood-Cl is kept const.

by intake of H<sub>2</sub>O. Urinary Cl falls during exposure to heat, whatever the urinary output may be. The CO<sub>2</sub> content and CO<sub>2</sub>-combining power of whole blood and the CO<sub>2</sub>-combining power of serum show an initial fall, but return to normal if H<sub>2</sub>O is being supplied. H<sub>2</sub>O increases the acid and NH<sub>3</sub> output in the urine. R. N. C.

Determination of the water content of the blood of 1239 boys and girls. T. RYÔ (Keijo J. Med., 1936, 7, 426—458).—The H<sub>2</sub>O content of the blood of males and females increases gradually during the 12th year of age. With males, a max. is reached at 13 years followed by a gradual decrease. The max. for females occurs at 14—15 years, remains steady for a year, and then slowly decreases. A. L.

Water content of the blood of various species of fish. K. KURODA and R. EBINA (Keijo J. Med., 1936, 7, 327—338). A. L.

Change in the water content of guinea-pig's blood during growth. K. KURODA and R. EBINA (Keijo J. Med., 1936, 7, 376—388).—The H<sub>2</sub>O content of the blood reaches a max. 3 weeks after birth, then decreases with age, becoming const. when the animal is 5—6 months old. A. L.

Water content of the blood of various species of birds. K. KURODA and R. EBINA (Keijo J. Med., 1936, 7, 459—476). A. L.

$pK'$  of serum and red cells. D. B. DILL, C. DALY, and W. H. FORBES (J. Biol. Chem., 1937, 117, 569—579).—It is confirmed that the  $pK'$  of serum of man, ox, and dog at 37° is 6.11. Over the physiological range of  $p_H$ , the  $pK'$  of human red blood cells is 6.04 in the oxygenated, 5.98 in the reduced, state. The  $pK'$  of ox cells is about 0.04 unit higher. Equations for the variations of these vals. with  $p_H$  and temp. are given. The design and construction of a suitable glass electrode are described. F. A. A.

Biological action of the so-called short waves [ $\lambda = 6.4$  m.]. J. LATKOWSKI and B. CHARLAMPOWICZ (Bull. Acad. Polonaise, 1936, B, 189—204).—The blood of rabbits within 1 hr. after exposure to radiation  $\lambda$  6.4 m. shows a diminished content of hæmoglobin, red blood cells, and serum-proteins, followed by a slow rise. During the hours following irradiation, blood-Ca decreases, and -K and -Na increase, the blood- $p_H$  shifts to the acid side, and the alkali reserve diminishes. Blood-albumin increases, and -globulin decreases. Results are discussed in relation to similar changes resulting from irradiation by widely different  $\lambda$ 's. F. A. A.

Solubility coefficients of cyclopropane for water, oils, and human blood.—See A., I, 178.

Individuality, from the aspect of hæmolysis, of the distribution of water between plasma and erythrocytes. Y. EGAMI (Keijo J. Med., 1936, 7, 339—375).—Examination of the blood of 200 oxen shows that the individual variations in the ease of hæmolysis of erythrocytes, the H<sub>2</sub>O contents of serum and plasma, and the  $d$  and  $\tau$  of the serum have a normal symmetrical distribution. A. L.

Effect of concentration of erythrocytes on the degree of hæmolysis. T. BAK (Keijo J. Med.,

1936, 7, 389—425).—In hypo-oligolytic media, the degree of hæmolysis is at a max. and decreases with increasing concn. of erythrocytes. In hyperoligolytic media, the hæmolysis is at a min. and reaches a const. val. with increasing concn. of erythrocytes.

A. L.

**Gelation of blood constituents.** W. KOPACZEWSKI (Compt. rend., 1937, 204, 453—456).—The gelation of serum, plasma, and red corpuscle suspensions by HCl, NaOH, or lactic acid is most rapid with moderate concns. Gelation by NaOH is reversible.

R. M. M. O.

**Flocculation in mixtures of filtered tetanus bouillon and antitetanus serum.** G. RAMON (Compt. rend. Soc. Biol., 1937, 124, 414—416).—The toxin neutralises the antitoxin in the mixture in which the flocculation appears first when variable quantities of serum are added to a fixed quantity of toxin.

H. G. R.

**Determination of the intrinsic antigenic power of tetanus toxin and anatoxin by flocculation.** G. RAMON, E. LEMETAYER, and R. RICHOU (Compt. rend. Soc. Biol., 1937, 124, 416—420). H. G. R.

**Chemistry of bacterial agglutination. III. Quantitative theory of agglutination.** M. HEIDELBERGER and E. A. KABAT (Proc. Soc. Exp. Biol. Med., 1936, 35, 301—303).—Experiments with pneumococcus suspensions confirm the chemical nature of agglutination, *i.e.*, combination of multivalent polysaccharide with multivalent antibody.

P. G. M.

**Action of chloroform on flagellary agglutination-*H* of vibrios.** P. C. VASSILLADIS (Ann. Inst. Pasteur, 1937, 58, 165—180).—The flagellary agglutination-*H* (thermolabile) of *V. cholerae* by the antiserum is enhanced (irreversibly) by extraction of the serum with CHCl<sub>3</sub>, a treatment which affords agglutination even with inactive (non-agglutinable) vibrios. The effect is due to activation of an agglutininogen and not to production of a new antigen.

F. O. H.

**Reversal by acidification of the agglutination by tryptaflavine.** V. SERTIC and N. A. BOULGAKOV (Compt. rend. Soc. Biol., 1937, 124, 217—218).—The degree of reversion varies with the strain of bacteria used.

H. G. R.

**Animal species and coagulation of serum.** W. KOPACZEWSKI (Protoplasma, 1936, 25, 16—24).—The rate of coagulation of serum by a given acid is characteristic for each species. Different acids produce different effects in the same serum, depending partly on the degree of dissociation and partly on the nature of the anion and its dehydrating action.

M. A. B.

**Streptococcus anticoagulant.** E. E. DART (Proc. Soc. Exp. Biol. Med., 1936, 35, 285—286).—Purified fibrinolysin is obtained by EtOH pptn. (75% ice-cold) from 24 hr. glucose-broth cultures of streptococci, which have no anticoagulant action. It is quantitatively destroyed if heated at 60° for 30 min., whilst the anticoagulant, which is sol. in 75% EtOH, resists heating at 100° for 30 min.

P. G. M.

**Precipitin reactions of helminth extracts.** L. L. EISENBRANDT (Proc. Soc. Exp. Biol. Med., 1936,

35, 322—325).—Helminth extracts have low N and protein concns., but they produce antisera in rabbits of high titre. These react more strongly with the homologous antigens than any heterologous antigen of equal N content.

P. G. M.

**Theory of precipitin reaction. II. An azo-protein-antibody system. III. Reaction between crystalline ovalbumin and its homologous antibody.** M. HEIDELBERGER and F. E. KENDALL (J. Exp. Med., 1935, 62, 467—483, 697—720).—II. The precipitin reaction is examined by means of an azoprotein-antibody system and is shown to comply with chemical laws.

III. The reaction is explained on the basis of chemical laws. Serum from the same animal after successive courses exhibits progressive changes consisting of the formation of more and more antibody capable of reacting with a large no. of chemically different groupings in the antigen mol. Anti-ovalbumin is not homogeneous. After prolonged immunisation the anti-serum contains much low-grade antibody incapable of forming ppts. unless the more reactive precipitin is present.

CH. ABS. (p)

**Influence of coagulation on the sensitising action of an antigen.** P. E. PINOY and G. FABIANI (Compt. rend. Soc. Biol., 1937, 124, 562—563).—Heat-coagulation has no effect on the sensitising power.

H. G. R.

**Protein fractions of serum as different antigens.** I. PIROSKY (Folia biol., 1933, 142).—Prep. of euglobulin and pseudoglobulin of different antigenic natures is described.

CH. ABS. (p)

**Properties of the "Vi" antigen of *Eberthella typhosa* and its corresponding antibody.** A. FELIX and S. S. BHATNAGAR (Brit. J. Exp. Path., 1935, 16, 422—434).

CH. ABS. (p)

**Immunising potency of antigenic components isolated from different strains of *B. typhosum*.** W. W. C. TOPLEY, H. RAISTRICK, J. WILSON, M. STACEY, S. W. CHALLINOR, and R. O. J. CLARK (Lancet, 1937, 232, 252—256).—Experiments which bear on the nature of the Vi antigen and the factors which determine its immunological behaviour are described. It appears possible to isolate from suitable strains of *B. typhosum* a chemically pure and stable antigen which has the immunising properties of the whole bacterial cells.

L. S. T.

**Phagocytosis of *Eberthella typhosa* in relation to its antigenic structure and to the antibody components of the sensitising system.** S. S. BHATNAGAR (Brit. J. Exp. Path., 1935, 16, 375—384).—The opsonic effect of normal serum is due to combined action of complement (I) and natural "O" antibody. The bacteriotropic effect of immune serum is due to combined action of (I) and immune "O" antibody. No essential difference exists between the activity of opsonic and bacteriotropic sera. The "H" antibody has little effect on phagocytosis, which is intimately associated with agglutinability by "O" antibody.

CH. ABS. (p)

**Species-non-specific antigenic factor in mammalian sera.** F. A. SIMON (J. Allergy, 1934, 6,

1—8).—Various mammalian sera contained an antigenic substance to which a patient with vasomotor rhinitis was highly sensitive. The properties of the active substance are examined. CH. ABS. (p)

**Preparation and antigenic properties of globin from hæmoglobins of different species.** C. A. JOHNSON and W. B. BRADLEY (J. Infect. Dis., 1935, 57, 70—73).—Globin (I), prepared from hæmoglobin (II) by acid hydrolysis and subsequent pptn. with  $\text{COMe}_2$ , has the same species-specificity as (II). When used as an antigen (I) induces the formation of precipitins in the antiserum which are identical with those produced by (II) from the same species. (I) is probably responsible for the antigenic properties of (II). CH. ABS. (p)

**Antigenic property of quinine hydrochloride.** Y. HIROSE (Sei-i-Kwai Med. J., 1934, 53, No. 12, 31—58).—A sp. antibody was produced by injection of quinine hydrochloride (I) into rabbits. Such rabbits showed increased tolerance to (I).

CH. ABS. (p)

**Immunising activity of certain chemical fractions isolated from hæmolytic streptococci.** T. C. STAMP and E. B. HENDRY (Lancet, 1937, 232, 257—259).—Fractions which induce active immunity in mice have been isolated from strains of hæmolytic streptococci of groups A and C. The active fraction from the group C strain is sol. in dil. acids and insol. in aq.  $\text{NH}_3$ . It is comparatively stable and not inactivated by  $\text{NH}_3$ . The fraction from group A is sol. in acid, but is inactivated by aq.  $\text{NH}_3$ . Both fractions appear to be proteins. L. S. T.

**Inactivation of "H" antigen by dilute mineral acid.** J. T. DUNCAN (Brit. J. Exp. Path., 1935, 16, 405—410).—"H" antigen is inactivated by appropriate amounts (ascertained by a titration-agglutination method) of dil. acids. The "O" antigen is but little affected by this treatment. CH. ABS. (p)

**Toxins of the dysentery bacillus. Thermostable toxic principles of the bacillus of Shiga.** L. MESROBEANU and A. BOIVIN (Compt. rend. Soc. Biol., 1937, 124, 439—442).—In both the rough and smooth forms, the complete somatic antigen is the chief constituent of the thermostable endotoxin with a toxic protein as an accessory. H. G. R.

**Toxins of the dysentery bacillus. Nature and biological properties of the toxic principles in the filtrate from broth cultures of the bacillus of Shiga.** A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 442—444).—The endotoxin is not produced in a culture of the smooth form at  $p_H$  7.2 but is found at  $p_H$  8 when autolysis can occur. H. G. R.

**Titration by flocculation of anti-dysenteric sera.** I. K. HALAPINE, L. BASILEVSKAIA, and N. SCHITKOVA (Ann. Inst. Pasteur, 1937, 58, 154—164).—The flocculation-titration of the sera with the corresponding toxin affords a method of assay of the antitoxin. O H

**Precipitating power of therapeutic anti-anthrax sera.** J. POCHON (Compt. rend. Soc. Biol., 1937, 124, 432—433).—Virulent or slightly attenuated *B. anthracoides* contain two antigens (anti-protein and

-sugar) one of which is destroyed by  $\text{EtOH-Et}_2\text{O}$  treatment, whilst the avirulent organism does not contain the latter. H. G. R.

**Isolation of immunologically pure antibody from the immune precipitate of pneumococcus, type I.** B. F. CHOW and H. WU (Chinese J. Physiol., 1937, 11, 139—153).—The immune ppt. is obtained from immune horse serum (180 c.c.) by addition of a solution of the corresponding polysaccharide (I). It is then suspended in 60 c.c. of  $\text{H}_2\text{O}$  and 3 c.c. of  $N/70\text{-NaOH}$  are added ( $p_H$  9.5). After keeping overnight at  $0^\circ$  1.55 c.c. of  $N/70\text{-HCl}$  are added +  $\text{NaCl}$  to 0.85% ( $p_H$  7.6). The antibody contained in the supernatant fluid is immunologically pure, 85—90% being pptd. by (I). P. G. M.

**Recovery of antibodies from immune agglutinate of pneumococcus, type I.** B. F. CHOW and H. WU (Chinese J. Physiol., 1937, 11, 155—162).—The antibodies can be recovered from the immune agglutinate by alkali-extraction; their agglutinin and protective activity is 16 times that of the original serum. The method is capable of general application. P. G. M.

**Isolation of a new fraction of protective antibody from immune rabbit serum of pneumococcus, type I.** B. F. CHOW and H. WU (Chinese J. Physiol., 1937, 11, 163—168).—A new fraction, immunologically different from the antipolysaccharide precipitin (I), has been obtained from the supernatant fluid after agglutination of "R" organisms, by further agglutination with the vaccine of the "S" organism, followed by alkali-extraction. The protective action of this fraction is 4 times that of (I). P. G. M.

**Isolation of pure antibodies of pneumococci, types II and III.** B. F. CHOW and H. WU (Chinese J. Physiol., 1937, 11, 169—173).—By means of an alkali-extraction of the immune ppt. (as for type I) a highly purified prep. of the precipitin and agglutinin of type II is obtained which is 20 times as active (100 for type III) as the original serum. P. G. M.

**Chemical nature of antibodies.** B. F. CHOW, K. LEE, and H. WU (Chinese J. Physiol., 1937, 11, 175—182).—Pure type I antipneumococcus precipitin (horse) has an isoelectric point at  $p_H$  7.6 and contains 14.47% of N. It is pptd. by half saturation with  $(\text{NH}_4)_2\text{SO}_4$  but not by one third saturation. The increase in  $\text{NH}_2\text{-N}$  on tryptic digestion runs parallel with the decrease in activity, and the substance behaves in all respects as a protein. P. G. M.

**Unitarian hypothesis of antibodies.** B. F. CHOW and H. WU (Chinese J. Physiol., 1937, 11, 183—192).—Immunologically pure precipitin of rabbit serum can accomplish all five immune reactions, thus proving the unitarian hypothesis. The failure of immune horse serum to produce passive anaphylaxis and to fix complement may be due to the presence of an inhibiting substance. P. G. M.

**Comparison of immunological activity of antibodies of pneumococcus, type I, from different animals.** K. LEE, B. F. CHOW, and H. WU (Chinese J. Physiol., 1937, 11, 193—199).—The immunological properties of pure precipitins from antipneumococcus (type I) immune sera of 3 horses

and 18 rabbits are const., whilst the mouse protection titre of the new fraction from rabbit sera varies considerably. P. G. M.

**Effect of immunisation on the distribution of serum-proteins.** S. LIU, B. F. CHOW, and K. LEE (Chinese J. Physiol., 1937, 11, 201—210).—Immunisation of rabbits against type I pneumococcus caused an increase in the % of serum-pseudoglobulin to 3 times the normal val., whilst with horses mainly the euglobulin fraction was affected. P. G. M.

**Isolation of a basic fraction from normal and immune horse sera.** S. LIU, H. WU, and B. F. CHOW (Chinese J. Physiol., 1937, 11, 211—222).—A basic globulin fraction was prepared from the H<sub>2</sub>O-sol. proteins of normal and immune sera by fractionation with MeOH or (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>; this fraction contained most of the antibody, and 53% of the total protein was pptd. by the homologous polysaccharide. The isoelectric point was  $p_H$  7.3—7.5. P. G. M.

**Antigenicity of the new polysaccharide preparation in rabbits as shown by complement fixation.** B. F. CHOW (Chinese J. Physiol., 1937, 11, 223—224).—The evidence confirms the belief that the polysaccharide is weakly antigenic in rabbits and is changed to Ac derivative on acid hydrolysis. P. G. M.

**Antibody properties of the viscous protein of serum.** P. G. CHARPENTIER, M. DOLADILHE, and C. MOREL (Compt. rend., 1937, 204, 451—453).—When Doladilhe's "viscous protein" is separated from a serum immunised to sheep corpuscles, it is able to sensitise these to hæmolytic action of guinea-pig or even sheep serum. R. M. M. O.

**Protein-fat antibodies.** K. MEYER (Compt. rend. Soc. Biol., 1937, 124, 430—431).—The protein-fat antibody cannot be considered as a mixture of the separate constituents. H. G. R.

**Stabilisation by formaldehyde and recovery by sodium naphthylaminetrisulphonate of the antitoxin of antidiphtheria serum.** H. GOLDIE (Compt. rend. Soc. Biol., 1937, 124, 550—554).—After CH<sub>2</sub>O treatment and pptn. at 4.6 with the Na salt, 75% of the activity can be recovered by redissolving the ppt. at 6.5, whilst a further 12% is present in the mother-liquor. H. G. R.

**Lipins and immunological reactions. I. Relation of phospholipins to type-specific reactions of antipneumococcus horse and rabbit sera.** F. L. HORSFALL, jun., and K. GOODNER (J. Exp. Med., 1935, 62, 485—503).—Removal of lipins from the antisera causes diminution or loss of agglutination and pptn. capacities. Activity can be restored to extracted immune horse serum by addition of lecithin and to rabbit serum by cephalin. CH. ABS. (p)

**Serological reactions of azoproteins derived from aromatic hydrocarbons and diaryl compounds.** J. JACOBS (J. Gen. Physiol., 1937, 20, 353—361).—Reactions of antisera from  $\beta$ -anthramine (I), *p*-aminodiphenyl, *p*-aminodiphenylmethane, and NH<sub>2</sub>Ph were tested with the homologous antigens and others formed from  $\beta$ -C<sub>10</sub>H<sub>7</sub>NH<sub>2</sub> (II) and *p*-toluidine (III). There is considerable reaction-specificity be-

tween various nuclei. NH<sub>2</sub>Ph and (III) are sharply differentiated from the others and (II) most resembles (I). Some sera have quite distinct differences in reaction with CH<sub>2</sub>Ph<sub>2</sub> and Ph<sub>2</sub>O, which are nearly as different from each other serologically as COPh<sub>3</sub> is from either. R. M. M. O.

**Serological study emphasising the hydrogen-ion concentration of the blood, in conjunction with the red-cell sedimentation test, leucocytic index, and complement fixation test.** K. T. SASANO (Amer. Rev. Tuberc., 1935, 32, 458—474).—The usually accepted normal range of blood- $p_H$  is too broad. Basic and comparable vals. are obtained with fasting blood in early morning. No correlation was apparent between blood- $p_H$  and the sedimentation rate of erythrocytes, the leucocytic reaction, or the complement fixation test for tuberculosis.

CH. ABS. (p)

**Complement fixation with vaccinal elementary body suspensions and anti-vaccinal rabbit serum.** M. H. FINLAYSON (Brit. J. Exp. Path., 1935, 16, 358—364).—The complement-fixing activity of the elementary body suspensions is partly removed by filtration through membranes having pore size 0.65  $\mu$  and removed completely by those having pores of 0.15  $\mu$  or by high-speed centrifuging. The antigenic activity is retained in the resuspended deposits. CH. ABS. (p)

**Influenza: preparation of immune sera in horses.** P. P. LAIDLAW, W. SMITH, C. H. ANDREWES, and G. W. DUNKIN (Brit. J. Exp. Path., 1935, 16, 275—290).—The method of prep. is described. In immune horse sera activity is largely associated with the pseudoglobulin fraction pptd. by salting out with 12—16% Na<sub>2</sub>SO<sub>4</sub>. CH. ABS. (p)

**Prophylaxis of experimental *V. septique* infection; application of antibacterial methods.** D. W. HENDERSON (Brit. J. Exp. Path., 1935, 393—405).—Inoculation tests with rabbits are described. The antibody produced by inoculation with formalised but unheated bacilli has a greater protective val. than that of the "O" antibody produced by inoculation with boiled cultures. This higher val. is independent of antitoxic action. CH. ABS. (p)

**Mechanism of the phenomena of tachyphylaxis.** J. SUGIMURA (Sei-i-Kwai Med. J., 1935, 54, No. 4, 64—93).—Tachyphylaxis was produced in rabbits by repeated injection of the coagulin from steer lung. During the phenomenon the blood-Ca and fibrinogen were substantially unchanged but there was marked diminution in platelets and prothrombin. CH. ABS. (p)

**Theory of hapten action.** J. H. LEWIS (J. Infect. Dis., 1935, 57, 94—103).—Haptens are presumed to combine chemically with proteins to form complete antigens. The combination is a foreign protein and must be formed prior to contact of haptens with proteins circulating in the blood. Preformed antibodies do not react with haptens but with the hapten-protein compounds, the protein being furnished by the antiserum with which the hapten is mixed.

CH. ABS. (p)

**Recent advances in immuno-chemistry.** H. RUDY (Angew. Chem., 1937, 50, 137—147).—A review.

**Azo dyes and immunobiology.** Schulz-Dale experiments with bis-*p*-succinanilic acid-azoresorcinol.—See A., II, 144.

**How does the human body obtain all the elements which it needs?** W. P. JORISSEN (Chem. Weekblad, 1937, 34, 146—149).—A review of the elementary compositions of the human body, the sea, and the earth's crust and a discussion on the significance of their similarity. S. C.

**Post-mortem changes in mineral salt distribution in nerve cells.** L. L. TUREN (Proc. Soc. Exp. Biol. Med., 1936, 35, 293—294).—Post-mortem demineralisation becomes noticeable at 3 hr. after death and reaches equilibrium at 15—20 hr. Salt loss in chilled tissues (10°) lags 7—8 hr. behind that in tissues at room temp. P. G. M.

**Distribution of magnesium in the tissues of the eye.** R. WOLFF and A. BOURQUARD (Compt. rend. Soc. Biol., 1937, 124, 319—320).—Mg in the retina and pigmented layer of the eye of the ox and sheep is high (90 mg. per 100 g. dry wt.), whilst that of the optic nerve and vitreous humour is similar to that of the serum (30—40 mg. per 100 g. dry wt.). H. G. R.

(A) **Distribution of magnesium in the animal organism: effect of dietary magnesium.** (B) **Grass staggers and magnesium metabolism.** I. J. CUNNINGHAM (New Zealand J. Sci. Tech., 1936, 18, 419—423, 424—428).—(A) Mg is uniformly distributed in all bones of individual sheep. In internal organs of cattle, sheep, and rats vals. are similar for individuals of the same or different species, those for heart and gluteal muscle being notably high. The Mg contents of bones and blood, but not those of other organs, are directly affected by that of the diet. (B) Deficiency of dietary Mg is not the cause of grass staggers in dairy cows. A. G. P.

**Iron content of teeth of normal and anæmic rats.** S. RATNER (J. Dental Res., 1935, 15, 89—92).—The Fe content of the upper incisors of rats receiving an anæmia-producing diet was < that of controls. The Fe content and colour of teeth are related. CH. ABS. (p)

**Nature of silica in living organisms. Silica of constitution and of interposition.** E. KAHANE and G. ANTOINE (Bull. Soc. Chim. biol., 1936, 18, 1769—1782).—The insol. residue after destruction of org. tissues by  $\text{HNO}_3$ - $\text{HClO}_4$  contains  $\text{SiO}_2$  in gelatinous form (usually the  $\text{SiO}_2$  of constitution found in very variable amounts in both animal and vegetable tissues), amorphous  $\text{SiO}_2$  of diatoms, sponges, bamboo, etc., and cryst.  $\text{SiO}_2$  as found in human lungs and other animal tissues (regarded as Si of interposition). Tables summarise the Si contents in these substances. P. W. C.

**Presence of silicious particles in animal organs.** G. ANTOINE (Bull. Soc. Chim. biol., 1936, 18, 1783—1788).— $\text{SiO}_2$  particles are isolated from various animal organs by means of the  $\text{HNO}_3$ - $\text{HClO}_4$

technique and their physical and chemical properties shown to resemble those of natural  $\text{SiO}_2$ .

P. W. C.

**Arsenic in human tissues and food animals.** I. **So-called normal arsenic.** W. F. BOOS and A. B. WERRY (New England J. Med., 1935, 213, 520—524).—As is not a normal constituent of the body. Small amounts detected are accounted for by ingestion with food. CH. ABS. (p)

**Composition of [New Zealand sheep] bones, normal and abnormal.** M. W. YOUNG (New Zealand J. Sci. Tech., 1936, 18, 391—395).—Analysis of the lower ends of femurs of normal adult and young sheep are recorded. Calcification proceeds slowly during the first year but marked changes in bone composition begin when the period of rapid body-wt. increase has passed. In certain disorders (but not in bush sickness) the ash/org. matter ratio is < normal. A. G. P.

**Biochemistry of bones during development.** V. CAGLIOTI and D. GIGANTE (Atti R. Accad. Lincei, 1936, [vi], 23, 878—880).—The mol. elements of bone, hydroxyapatite and the peptide chain, have the same spacial distribution of 6.88—6.90 Å. In the rat, X-ray patterns indicate that orientation of the elements occurs during growth and firstly in those bones where the need for solidity (e.g., for walking) is greatest. F. O. H.

**Crystal orientation in tooth-enamel.** J. THEWLIS (Naturwiss., 1937, 25, 42—43; cf. A., 1936, 623, 1010, 1011).—Human tooth-enamel is characterised by a double thread structure. "Good" enamel, with a smooth surface, and showing no coloration with fuchsin, possesses a high degree of orientation. "Bad" enamel shows a weak thread diagram. Enamel is "bad" when one thread axis is present, "good" when the other is present either alone, or with the first. The polarisation-microscopic method of Schmidt (A., 1936, 1010) is criticised as giving only a generalised determination of orientation. A. J. M.

**Crystal orientation in tooth-enamel.** W. I. SCHMIDT (Naturwiss., 1937, 25, 43).—Complicated superstructures of numerous histological elements may give rise to irregularities in the X-ray diagram for inorg. crystallites. It is possible that the single and double thread structure of tooth-enamel observed by Thewlis (cf. preceding abstract) may be due to a parallel and crossed arrangement of the crystal prisms. A. J. M.

**Analysis of flesh and entrails of birds and rabbits.** G. BALBONI (Quad. Nutrizione, 1935, 1, 450—542; Chem. Zentr., 1936, i, 2766).—Analyses are recorded. A. G. P.

**$p_H$  of muscle.** W. O. FENN and F. W. MAURER (Protoplasma, 1935, 24, 337—345).—The plasma surrounding frog muscle contains 2.6 times as much  $\text{HCO}_3^-$  as the muscle fibres. Allowing for this a  $p_H$  of 6.9 for the interior of the fibres and of 7.34 for the extracellular fluid is calc. from the Henderson-Hasselbalch equation. A micro-method using an indicator gives  $p_H$  7.4 for the extracellular fluid. M. A. B.

"Hydrophoby" of the hair. V. PTSCHHELIN (Kolloid. Shurn., 1936, 2, 247—248).—When shaken with  $H_2O$  and  $C_6H_6$  rabbit hair goes into the  $C_6H_6$  layer even if it has previously been boiled with  $H_2O$ , dil. alkali, acid,  $EtOH$ ,  $Et_2O$ , or  $CS_2$ , or treated with saponin. Only boiling with conc. alkali corrodes the hair and makes it hydrophilic. J. J. B.

[Determination of] cystine in wool. S. D. ROSSOUW [with WILKEN-JORDEN] (S. African J. Sci., 1935, 32, 135—136; Chem. Zentr., 1936, i, 2597).—The method depends on the pptn. of a very insol. Cu mercaptide of cystine from  $H_2SO_4$ -hydrolysed material, reduction of the mercaptide in acid by Zn, removal of residual Cu and Zn, and colorimetric determination of the resulting cysteine by Sullivan's method. Vals. for grass and wool are given.

A. G. P.

Clinical significance of the creatine reserve of the human heart. M. BODANSKY and J. F. PILCHER (Arch. Int. Med., 1937, 59, 232—244).—Determinations of the creatine concn. of the right and left ventricle and the papillary heart muscles are discussed statistically. Significant differences exist between the mean results for groups with and without evidence of heart disease but individual results are diverse. E. M. W.

Heterogony of the glutathione content of newborn rabbits. I. M. LERNER, P. W. GREGORY, and H. GOSS (Proc. Soc. Exp. Biol. Med., 1936, 35, 283—285).—Each of the 4 breeds studied has a characteristic glutathione content and rate of change of this factor, which is related to the adult size of the breed.

P. G. M.

Chemical constituents of *hsiung-chang* (bear's paw). T. H. TANG and Y. H. CHAO (J. Chinese Chem. Soc., 1937, 5, 9—13).—Dried *hsiung-chang* (after boiling in  $H_2O$ ) contains fat 43.90, crude protein (I) 55.23, total N 8.83, and ash 0.94%. From the hydrolysate (25%  $H_2SO_4$ ) of (I) are isolated aspartic and glutamic acids, phenylalanine, leucine, tyrosine, proline, arginine + alanine, and valine oxyvaline.

J. W. B.

Depot fat of *Varanus salvator* (Ceylon). T. P. HILDITCH and H. PAUL (Biochem. J., 1937, 31, 227—228).—The fat of the Ceylon lizard, *V. salvator*, Laur., contains, like the fats of marine animals, 12% of palmitoleic acid and small amounts (5%) of  $C_{20}$  unsaturated acids and, like the fats of land animals, a high content (43%) of palmitic and stearic acids.

P. W. C.

Influence of fasting on the histophysiology of the pulmonary lipins. L. BINET, J. VERNE, and J. L. PARROT (Compt. rend. Soc. Biol., 1937, 124, 342—344).—The lung contains a small fraction of the lipin reserves of the body and, during fasting, the adventitious fatty globules disappear but intracapillary fatty globules remain with a possible accumulation of ketonic substances. H. G. R.

Physical chemistry of lipins. IV. Influence of narcotics on the salt-binding capacity of lecithin. M. SPIEGEL-ADOLF (Proc. Soc. Exp. Biol. Med., 1936, 35, 263—267; cf. A., 1935, 1523).—Alcohols decrease the salt-binding capacity of lecithin in proportion to the length of the chain; it is nearly

abolished by  $C_5H_{11}OH$ . The opacity of the sol and the sensitivity to salt pptn. increase at the same time.

P. G. M.

Determination of parallel variations in liver-glycogen and -lipin by multiple sampling in the same dog. P. CRISTOL, L. HÉDON, A. LOUBATIERES, and P. MONNIER (Compt. rend. Soc. Biol., 1937, 124, 637—638).

H. G. R.

Simultaneous bilateral  $\beta$ -oxidation of dibasic fatty acid.—See A., II, 135.

(A) Coagulation of myosin by dehydration. (B) Coagulation in muscle. A. E. MIRSKY (J. Gen. Physiol., 1937, 20, 455—459, 461—474).—(A) Drying with freezing renders myosin (I) insol. without alteration of its detectable  $\cdot SH$  content. Of all *in vitro* coagulation methods this alone approaches the change of solubility unaccompanied by change in chemically detectable groups which occurs in muscular contraction. Such dehydration resembles coagulation *in vivo*  $\gg$  coagulation by denaturing agents.

(B) Frog muscle can be prepared as a dry powder containing myosin (I) in its original condition. It rapidly coagulates on addition of  $H_2O$  equal to that removed in drying, but not when the powder is allowed to imbibe excess of  $H_2O$ . Addition of dil. aq. KCl causes coagulation. Conc. solutions of KCl do not coagulate but extract (I) and ppt. it reversibly on dilution. (I) in intact muscle, unlike extracted (I), is not coagulated by drying and freezing, but that in swollen muscle is contracted by freezing. The coagulation process has a temp. coeff. of about 2 and does not require free  $Ca^{++}$ . Coagulation of (I) occurs only when it is embedded in the structure of muscle. The orientation of (I) mols. is considered in relation to coagulation.

R. M. M. O.

$\gamma$ -Aminobutyric acid as a constituent of proteins.—See A., II, 138.

Constitution of the lactoflavinphosphoric acid from liver. P. KARRER, P. FREI, and H. MEERWEIN (Helv. Chim. Acta, 1937, 20, 79—83).—Lactoflavinphosphoric acid (I) isolated from liver is mixed with an adenine nucleotide, from which it cannot be separated by any adsorption process; the existence of a chemical compound of the substances is not assumed. Oxidation of (I) with  $HIO_4$  does not yield  $CH_2O$ ;  $PO_4$  cannot therefore be present at  $C_{(2)}$  or  $C_{(3)}$  but is probably at  $C_{(5)}$ . (I) from yeast is probably a  $C_{(5)}$  compound.

H. W.

Cytochrome-C. I. Is porphyrin-C an amino-acid porphyrin? H. KATAGIRI, K. MASUDA, and T. HMEMOTO (Bull. Agric. Chem. Soc. Japan, 1937, 13, 94—98).—Prep. and purification of cytochrome-C (I) and porphyrin-C (II) are described. (I) is not a  $NH_2$ -acid porphyrin since it is obtained by the action of  $AcOH$  and 20%  $H_2SO_4$  on aq. hæmatin containing  $Na_2S_2O_4$ . Deutero-, meso-, and hæmato-porphyrin (III) are prepared from (II). Decomp. of (I) with 40%  $H_2SO_4$  gave Fe and (III) (1 : 1 mol.).

J. N. A.

Constitution of uro- and mussel shell-porphyrin. Uroporphyrin III in congenital porphyrinuria.—See A., II, 168.

Fluorescence spectrum of a pigment isolated from *Holothuria*. H. BIERRY and B. GOUZON (Compt. rend. Soc. Biol., 1937, 124, 323—324).—Extraction of *H. nigra* with EtOH yields a pigment having a green fluorescence which is stable to sunlight.

H. G. R.

Vegetable sterols in toads. R. HUTTEL and H. BEHRINGER (Z. physiol. Chem., 1937, 245, 175—180; cf. Wieland *et al.*, A., 1936, 1252).—The poisonous secretion from toads (*Bufo vulgaris*, *B. vulgaris formosus*, *B. arenarum*, and *Alytes obstetricans*) yielded  $\gamma$ -sitosterol (I) on extraction with light petroleum, evaporation of the solvent, dissolution in boiling MeOH and chromatographic adsorption of the crude sterol in  $C_6H_6$  on  $Al_2O_3$ . 80—95% of the sterol extracted from the skin of the toads was cholesterol (II), the remainder being (I), which occurred chiefly in the free state. Little or no (II) and no pro-vitamin were found in the secretion.

W. McC.

Blood-clotting action of human milk. M. JACOBY and S. ADLER (Enzymologia, 1937, 1, 373—376).—The blood-coagulating substance in human milk cannot be thrombin as it coagulates plasma only in the presence of Ca. The substance in 0.2 c.c. of human milk is completely neutralised by 0.3—0.4 mg. of heparin. Its cytozyme nature is supported by its antigenic character. No antibody is formed after injection of cow's milk.

E. A. H. R.

Variations in the fat and protein contents of cow's milk during milking. E. NEUTARD (Diss., Tierartzt. Hochschule, Hanover, 1934; Bied. Zentr., 1935, A, 6, 192).—The fat content of milk increases, though not uniformly, during milking. The protein content is unrelated to the fat content or to the stage of the milking process.

A. G. P.

Relative digestibility of caseins in their artificial and natural environments. K. BHAGVAT (Proc. Soc. Biol. Chem. India, 1937, 1, 22—24).—The milks of various animals differ in their albumin (I) content. In general the dispersion of the casein (II) increases with (I) content. The (II) of asses' milk, which contains much (I), is very highly dispersed, and more readily digestible *in vitro* than is cow's milk. If, however, the pptd. protein is treated with  $PO_4$ -buffer solution, that from asses' milk redisperses much less readily than that from cow's milk, and the redispersed protein is correspondingly less digestible. The indigestible asses' (I) apparently protects the (II) particles from digestion. The bearing of these results on the humanisation of milk is discussed.

W. O. K.

Determination of lipase in milk. R. REDER (Proc. Oklahoma Acad. Sci., 1935, 15, 49—50).—In McGillivray's modified method a sterile milk-olive oil emulsion is a better medium for lipase activity than  $H_2O$ -oil emulsion. 0.6 mg. of lipase is detectable after incubation for 1 hr., and 0.05 mg. after 24 hr.

CH. ABS. (p)

Non-protein-nitrogen of milk. K. BHAGVAT (Current Sci., 1936, 5, 297—298).—The composition of the non-protein-N fractions of the milk of the cow and ass shows no significant differences.

J. L. D.

Butyric acid content of milk.—See B., 1937, 179.

Determination of protein in spinal fluid. R. S. HUBBARD and H. R. GARBUTT (Amer. J. Clin. Path., 1935, 5, 433—442).—The fluid is treated with  $CCl_3CO_2H$  (hot), cooled, and after addition of abs. MeOH is centrifuged. The ppt. is digested with Folin-Wu oxidising reagent, Rochelle salt is added, and  $NH_3$  determined by Nessler's reagent. 0.005—0.25% of protein may be determined in 2 c.c. of fluid.

CH. ABS. (p)

Spectrographic analyses of human spinal fluid. G. H. SCOTT and J. H. McMILLEN (Proc. Soc. Exp. Biol. Med., 1936, 35, 287—289).—All spinal fluids can be expected to show spectrographic evidence of Al, Ba, Sr, and B, half of them Pb, and a quarter Sn.

P. G. M.

Osmotic pressure of the colloids of the vitreous humour. C. LENTI (Atti R. Accad. Lincei, 1936, [vi], 24, 223—226).—Ox humour,  $d$  1.007—1.008,  $n_D^{25}$  1.335130—1.336052, residue on drying 0.57—1.62%,  $\Delta$  0.490—0.585°, N content 0.0195—0.0347%, has a colloid-osmotic pressure of 6.75—23.36 (average 12.42) mm.  $H_2O$  which approx.  $\propto$  the N (or protein) content.

F. O. H.

Secretagogue and depressor substances in saliva and pancreatic juice. J. A. GUIMARAIS (J. Physiol., 1936, 86, 95—108).—Sympathetic saliva contains substances causing submaxillary secretion that are not identical with the depressor constituent. EtOH extracts exhibit both effects, but to a smaller degree than saliva itself. Dog's pancreatic juice, obtained either by secretion or vagal stimulation, contains pancreatic secretagogues, the potency of which  $\propto$  the concn. of the juice. Pancreatic juice does not cause submaxillary secretion nor saliva pancreatic secretion, but the depressor substances in both are similar in thermolability and non-inhibition by atropine.

R. N. C.

$p_H$  of normal resting saliva. II. Diurnal variation. III. Effects of vitamin-A and -D in school children. R. E. BRAWLEY (J. Dental Res., 1935, 15, 79—86; cf. A., 1936, 501).—II. The average normal  $p_H$  of saliva was 6.75. Vals. increased slightly 1 hr. before meals and diminished about 1 hr. after. Variations were independent of age and sex.

III. Feeding vitamin-A and -D produced no significant change in  $p_H$  during a 1 year experimental period.

CH. ABS. (p)

Effect of fundusectomy on acidity of gastric and duodenal contents. J. R. WATSON (Arch. Surg., 1935, 31, 1—9).—Reduction in both free and total gastric acidity immediately followed extensive fundal resection, probably through removal of acid-secreting glands.

CH. ABS. (p)

Duodenum and automatic control of gastric acidity. W. J. GRIFFITHS (J. Physiol., 1936, 87, 34—40).—Experimental introduction of HCl into the normal human duodenum reduces HCl secretion in response to an EtOH test drink, or arrests it before it reaches its max. if it has been established previously by EtOH. Neutral Cl' and peptic activity of the gastric contents show a marked rise in both cases.

R. N. C.

**Reduction of cholic acids by Bouveault's method.**—See A., II, 100.

**Gastric secretion of bromine during bromine therapy.** C. CHATAGNON (Compt. rend., 1936, 203, 1398—1399; cf. this vol., 88).—In a woman, aged 45, who received 33 g. of NaBr during 14 days, the ratio of 1000Br : Cl in the gastric juice increased from 1—2 to 1815, and returned to normal 60 days afterwards. In the blood the ratio increased from 0.6 to 315. During the whole period blood-Cl underwent only normal fluctuations. J. N. A.

**Urinary excretion of bromine after ingestion of sodium bromide.** C. CHATAGNON (Compt. rend., 1937, 204, 72—74).—NaBr (1 g.), administered orally to a woman, was excreted in 31 days, whilst the Cl excretion was normal. Repeated doses (33 g. of NaBr in 14 days) were excreted in 69 days, the max. daily excretion being 1.7 g. J. L. D.

**Post-partum urinary elimination of amino- and amino-ammoniacal nitrogen.** P. OLIVIER-PALLUD and G. GLOMAUD (Compt. rend. Soc. Biol., 1937, 124, 211—213).—The max. elimination occurs on the 3rd day, the val. decreasing to the 5th day, when it becomes const. or shows a slight increase. H. G. R.

**Determination of urinary lactic acid.** G. MATTHIESSEN (Biochem. Z., 1937, 289, 167—171).—The Muller-Parcham technique (A., 1933, 966) is slightly modified for application to urine. Urine of normal subjects contains between 16 (fasting, morning) and 80 (noon) mg. of lactic acid per 100 c.c. P. W. C.

**Detection of morphine in urine of opium-addicts.** C. K. LIANG (Chinese Med. J., 1937, 51, 211—216).—Older methods of detection of morphine are combined with new features to make possible the detection of 0.005 mg. in 50 c.c. of urine. E. W. W.

**Urobilin. Modification of the Schlesinger reaction in urine analysis.** O. M. MIGLIACCIO (Día méd., 1933, 6, 224).—The sample is mixed with an equal vol. of 10% Zn(OAc)<sub>2</sub> in EtOH and the mixture is centrifuged. Fluorescence in the clear liquid indicates the presence of urobilin. CH. ABS. (*p*)

**Urobilinogen. II. Urobilinogen in urine and fæces of subjects without evidence of disease of liver or biliary tract. III. Per diem excretion of urobilinogen in common forms of jaundice and disease of liver.** C. J. WATSON (Arch. Int. Med., 1937, 59, 196—205, 206—231).—II. The amount of urobilinogen (I) excreted in 24 hr. by a normal adult in the urine and fæces is 0—4 mg. and 40—280 mg., respectively. Variations from the normal in diseases other than of the liver and biliary tract are discussed.

III. Urinary (I) is not much increased in jaundice due to stone unless complications are present. Jaundice due to neoplasm is characterised by very small amounts of (I) in the fæces with traces or none in the urine. Urinary (I) increases in diffuse hepatic disease, and in hæmolytic jaundice increases are observed which cannot be correlated with increased destruction of blood. E. M. W.

**Results of stool urobilinogen determinations in disturbed colouring-matter balance.** H. FLEISCHHACKER and H. SEYFRIED (Wien. klin. Woch., 1935, 48, 1604—1607; Chem. Zentr., 1936, i, 2156).—The clinical significance of such determinations is discussed. H. N. R.

**Influence of bile acid on elimination of bilirubin in urine.** H. WESPI (Klin. Woch., 1935, 14, 1820—1821; Chem. Zentr., 1936, i, 2386).—Bilirubin appears in rabbit urine after injection of >10 mg. per kg. body-wt. Simultaneous injection of bile acid lowers this threshold val. possibly by inducing the transformation of bilirubin-I into -II. A. G. P.

**Existence in blood and urine of substances promoting liver function. II. Urine.** N. MIZUTA and T. MATSUURA (Japan J. Gastroenterol., 1935, 7, 57—68; cf. A., 1936, 1146).—Normal human and rabbit urines contain a PhOH-like substance promoting the excretion of azofuchsin-G from livers of rabbits poisoned with U nitrate or cantharidin. The substance is thermostable in acid or neutral media but is rapidly destroyed by heating with alkali. CH. ABS. (*p*)

**Significance of diastase content of urine in various surgical conditions.** J. WAKO (Tôhoku J. Exp. Med., 1935, 26, 268—290).—Urinary diastase changes in cases of various diseases. CH. ABS. (*p*)

**Chemistry and prophylaxis.** A. VERNES (Chim. et Ind., 1937, 37, 17—30).—Various techniques and data afforded by their use on the properties of serum as applied to the diagnosis and prophylaxis of tuberculosis, cancer, syphilis, etc. are described. F. O. H.

**Effect of cortin on renal excretion and balance of electrolytes in humans.** G. W. THORN, H. R. GARbutt, F. A. HITCHCOCK, and F. A. HARTMAN (Proc. Soc. Exp. Biol. Med., 1936, 35, 247—248).—Cortin injections reduce Na excretion by 42% in normal and 20—50% in cases with Addison's disease (5 hr. period); K excretion increases more in these patients than in normal subjects. P. G. M.

**Relation of drug therapy to agranulocytosis.** R. R. KRACKE and F. P. PARKER (J. Amer. Med. Assoc., 1935, 105, 960—966).—Amidopyrine, dinitrophenol, and related drugs cause agranulocytosis. CH. ABS. (*p*)

**Drug or protein allergy as a cause of agranulocytosis and certain types of purpura.** F. T. HUNTER (New England J. Med., 1935, 213, 663—673).—The disorders are allergic and may be caused by amidopyrine, arsphenamine, Au salts, dinitrophenol, or foreign proteins. CH. ABS. (*p*)

**Treatment of milk allergy and its basic principles.** B. RATNER (J. Amer. Med. Assoc., 1935, 105, 934—938).—Lactalbumin and lactoglobulin are usually responsible for allergy. Coagulation of these proteins on heating lowers the allergic effects of milk. CH. ABS. (*p*)

**Protein content of extracts of various allergens.** R. S. HUBBARD and H. OSGOOD (J. Allergy, 1935, 6, 231—239).—A micro-method for determining N in phosphotungstic acid or CCl<sub>3</sub>·CO<sub>2</sub>H pptts. is described. CH. ABS. (*p*)

**Preparation of pollen extracts.** J. M. ANDERSON (J. Allergy, 1935, 6, 244—246).—A solution containing 0.86% of NaCl in 1:1 glycerol-H<sub>2</sub>O is used as an extractant. CH. ABS. (p)

**Histamine and typhoid protein in control of asthma and hay fever.** N. F. THIBERGE (J. Allergy, 1935, 6, 282—287).—The EtOH-sol. portion of typhoid protein which has been hydrolysed by KOH is safer than histamine in use. CH. ABS. (p)

**Constituents of the antiasthmatic, Epokan.** H. KREITMAIR (Munch. med. Woch., 1936, 83, 141—142; Chem. Zentr., 1936, i, 2587—2588).—The principal constituents are 1-ephedrine-coumarin carbonate, pyrazinemonocarboxylic acid anhydride, and *p*-tropine benzyl ester hydrochloride. A. G. P.

**Sex variations in the utilisation of iron by anæmic rats.** M. C. SMITH and L. OTIS (Science, 1937, 85, 125—126).—Hæmoglobin regeneration in anæmic female rats is > in males. This may explain the reported anomalies concerning the availability of Fe in foodstuffs. L. S. T.

**Hæmoglobin regeneration in chronic hæmorrhagic anæmia of dogs (Whipple).** I. Effect of iron and protein feeding. C. C. STURGIS and G. E. FARRAR, jun. (J. Exp. Med., 1935, 62, 457—465).—Addition of liver to a diet for dogs with a slowly regenerating anæmia increased regeneration > did the equiv. amount of inorg. Fe. The effect of liver is not due to its content of NH<sub>2</sub>-acids. Whipple's anæmia serves as an index of hæmoglobin-producing power. CH. ABS. (p)

**Anæmia of infancy and early childhood. X. Anæmia of infantile scurvy.** L. G. PARSONS and W. C. SMALLWOOD (Arch. Dis. Childhood, 1935, 10, 327—336).—The anæmia is due to vitamin-C deficiency. -C is necessary in all stages of maturation of red cells. CH. ABS. (p)

**Specific effect of ascorbic acid on the anæmia of scurvy.** D. M. DUNLOP and H. SCARBOROUGH (Edinburgh Med. J., 1935, 42, 476—482).—Daily administration of 60 mg. of ascorbic acid to scurvy patients increased the red cell count and hæmoglobin content of blood. CH. ABS. (p)

**Treatment of secondary anæmia.** S. O. FOSTER (Med. Ann. Dist. Columbia, 1935, 4, 212—216).—Fe<sup>II</sup> is more effective than Fe<sup>III</sup>. Cu enhances the clinical action. "Primary" and "secondary" anæmia liver fractions are differentiated. Vitamin-A, -B<sub>2</sub>, and -C, phenylalanine, tyrosine, proline, arginine, and glutamic acid are useful adjuvants. Fe<sup>II</sup> is more effective in acid than in neutral or alkaline media. CH. ABS. (p)

**Supplementing soil with iron and copper for prevention of anæmia in young pigs.** L. H. MOE, W. A. CRAFT, and C. P. THOMPSON (J. Amer. Vet. Med. Assoc., 1935, 40, 302—311).—Piglings having access to 50 lb. of soil to which were added 9 g. of FeSO<sub>4</sub> and 1.5 g. of CuSO<sub>4</sub> showed better growth increases and higher hæmoglobin levels than did controls. CH. ABS. (p)

**Isolation of the anti-anæmic principle of liver.** B. STRANDELL (Acta med. Scand. [Suppl.], 1935, 71,

1—52; Chem. Zentr., 1936, i, 2130).—From 100 g. of liver 0.0002 g. of active substance was obtained. 0.002 g. in H<sub>2</sub>O was an effective dose in cases of pernicious anæmia. A. G. P.

**Diagnostic value of phosphatase determinations in study of bone tumours.** C. C. SIMMONS and C. C. FRANSEEN (Ann. Surg., 1935, 102, 555—562).—Plasma-phosphatase increased in metastatic carcinoma and œstrogenic sarcoma. CH. ABS. (p)

**Blood radiation in disease, especially in tumours.** W. W. SIEBERT and H. SEFFERT (Biochem. Z., 1937, 289, 292—293).—By mixing equal parts of blood of various pathological cases (mitogenetically inactive) with normal blood (mitogenetically active) the activity of the latter often disappears when the disease involves tumour formation but not with many other diseases. Certain exceptions are discussed. P. W. C.

**Preparation of an extract of human liver capable of producing tumours.** S. A. NEUFACH (Compt. rend. Soc. Biol., 1937, 124, 616—617).—The liver is minced and extracted with C<sub>6</sub>H<sub>6</sub> for an hr. in the light at room temp. and then for several days in the dark at 0°. H. G. R.

**Influence of diets containing proteins of various molluscs on the growth of tumours in rats.** S. TOXUYAMA and W. NAKAHARA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, 31, 85—98; cf. A., 1936, 1406).—Diets of shell-fish proteins have a more stimulating influence on the growth of tumours implanted into rats than have those of fish proteins. Tumour growth with diets of proteins of cephalopods is still less. Generally, those shell-fish proteins inducing good body-growth before implantation also enhance tumour development; with scallop, however, body-growth was excellent but tumour growth poor. A. L.

**Experimental production of malignant tumours by a benzene extract of cancerous liver. Endogenous carcinogenic substances.** L. SCHABAD (Compt. rend. Soc. Biol., 1937, 124, 213—216).—Injection of a C<sub>6</sub>H<sub>6</sub> extract of the liver from a case of cancer of the stomach induced sarcoma and carcinoma in mice. H. G. R.

**Tumour metabolism. IX. Effect of cozymase on glycolysis in tumour extracts.** E. BOYLAND, M. E. BOYLAND, and G. D. GREVILLE. **X. Action of colchicine and *B. typhosus* extract.** E. BOYLAND and M. E. BOYLAND (Biochem. J., 1937, 31, 461—466, 454—460).—IX. Added cozymase increases glycolysis of hexose diphosphate, hexose phosphate, and glucose (I), to a rate comparable with that of (I) breakdown in the original tissue. Cozymase is present in tumour tissue but is destroyed rapidly in the extract.

X. The lethal dose of colchicine (II) injected intraperitoneally in mice is lowered by the presence of tumours. The injection also diminishes the ascorbic acid contents of liver, intestine, and tumours and renders tumours hæmorrhagic; these effects resemble those of the *B. typhosus* extract. Injection of (II) is followed by a depressed respiration in surviving tumour but not in liver; its addition *in vitro* to the

tissue also depresses respiration but far less strongly than colchicine, which is much less potent *in vivo*.

R. M. M. O.

**Genesis of cancer: general and local factors in the origin of cancer.** L. T. LARIONOV (Z. Krebsforsch., 1935, 43, 120; Chem. Zentr., 1936, i, 1891).—Pre-disposing factors are considered.

A. G. P.

**Chemistry of cancer.** B. LUSTIG (Z. Krebsforsch., 1935, 43, 156—162; Chem. Zentr., 1936, i, 2117).—Christiani's theory of the pre-elective action of cholesteryl esters is discredited.

A. G. P.

**Bacteriological test of von Brehmer's cancer diagnosis.** L. LANGE (Z. Krebsforsch., 1935, 43, 196—216; Chem. Zentr., 1936, i, 2118).—von Brehmer's test is valueless.

A. G. P.

**Von Brehmer's determination of blood-reaction in health and disease especially in cancer.** H. DIECKMANN and H. MOHR (Z. Krebsforsch., 1935, 43, 217—254; Chem. Zentr., 1936, i, 2118).—Use of blood- $p_H$  measurements in diagnosis, and the theory of the significance of alkalosis in the origin of cancer (von Brehmer) are unsound.

A. G. P.

**Value of some cancer reactions in early diagnosis of cancer of the uterus.** H. BELOHRADSKY (Wien. klin. Woch., 1935, 48, 1612—1615; Chem. Zentr., 1936, i, 2117).—Various biochemical tests examined are pronounced unsuitable. Histological methods are recommended.

A. G. P.

**Value of ether and chloroform narcosis in treatment of cancer.** R. W. BENNER (Anesthesia and Analgesia, 1935, 14, 205—209).—High alkalosis in blood is associated with malignancy. Anaesthesia with  $\text{CHCl}_3$  and  $\text{Et}_2\text{O}$  causes a beneficial acidosis. Blood-Ca is increased.

CH. ABS. (p)

**Serological investigations on substance present in urine of cancer patients.** M. ARON (Compt. rend., 1936, 203, 1550—1552; cf. A., 1936, 626).—Incubation at  $38^\circ$  for 16—18 hr. of a mixture of a purified  $\text{EtOH}$  extract of cancer urine with blood-serum of a cancer patient produces a distinct turbidity and in some cases flocculation. Normal sera give a very slight or no reaction. Cancer serum does not give the reaction if the urine extract is heated at  $90^\circ$  for  $\frac{1}{2}$  hr., whilst certain non-cancerous sera retain their reactivity under these conditions.

J. N. A.

**Biochemical and biological changes in experimental mouse and guinea-pig carcinoma.** F. LASCH and B. LUSTIG (Z. Krebsforsch., 1935, 43, 146—155; Chem. Zentr., 1936, i, 1891).—After 4 weeks' development of experimental carcinoma there was an increase in protein-sugars and a decrease in Mg in serum, change in the Freund and Kammer reaction in serum and faeces, increased K and Cl, and decreased Na, irrespective of the original vals. Blood- $p_H$ , white cell count, serum-cholesterol, -Ca, and -inorg. P, and the sedimentation time were unchanged.

A. G. P.

**Trypsin, cathepsin, amylase, and lipase of cancerous tissues and in carcinomatous blood.** G. VERCELLANA (Z. Krebsforsch., 1935, 43, 163—171; Chem. Zentr., 1936, i, 1891—1892).—Except

I (A., III.)

in a case of parotid tumour, none of the enzymes could be detected. In amylase tests the I consumption of alkaline glycerol affords a source of error in examining glycerol extracts.

A. G. P.

**Adsorption and elution of the Rous sarcoma agent.** E. M. FRAENKEL and C. A. MAWSON (Brit. J. Exp. Path., 1935, 16, 416—422).—The best adsorptive agent was Willstätter C and D  $\text{Al}_2\text{O}_3$ . Max. potency of eluates was obtained by adsorption at  $p_H$  6.0 and elution at 8.4.

CH. ABS. (p)

**Dietary factors in the production of dental disease in experimental animals, with special reference to the rat. I. Dental caries.** J. D. KING (Brit. Dental J., 1935, 59, 233—244, 305—316).—Diets of maize starch, rice starch, cane sugar, or finely ground yellow maize with deficiency of vitamins and mineral salts did not produce abnormalities in molar teeth. There was high incidence of Gram-positive lesions in decalcified sections of the dentine of lower molars of rats receiving diets composed mainly of coarse yellow maize or whole brown rice. Upper teeth were relatively free from these defects.

CH. ABS. (p)

**Local factors influencing dental caries: study of organic matter associated with enamel.** P. PRINCUS (Brit. Dental J., 1935, 59, 372—391).—Org. matter from enamel resembled keratin in some respects. Decalcification of enamel proceeds at different rates across and along the dental rods. The effect of synthetic saliva and lactic acid on tooth sections was negligible. An acid-resistant matrix occurs in enamel.

CH. ABS. (p)

**Relation between nutritional deficiencies and (a) facial and dental arch deformities, (b) loss of immunity to dental caries, among South Sea Islanders and Florida Indians.** W. A. PRICE (Dental Cosmos, 1935, 77, 1033—1045).—The diet of the mother during gestation and lactation and of the child during growth determines the degree of reproduction of the ancestral physical pattern. Nutritional deficiency can change the racial pattern even in a single generation, and tends to reduce immunity to certain diseases.

CH. ABS. (p)

**Comparison in five types of animals of the effects of dietary egg white and of a specific factor given orally or parenterally.** J. G. LEASE, H. T. PARSONS, and E. KELLY (Biochem. J., 1937, 31, 433—437).—In the chick, rat, rabbit, and monkey but not in the guinea-pig, a diet with a toxic excess of dried egg white produces a characteristic dermatitis. Individual variations depend partly on the variability of existing stores of the factor protecting against "egg white injury."

R. M. M. O.

**Diabetes mellitus. Analysis of 347 cases in Chinese patients.** I. S. H. WANG (Chinese Med. J., 1937, 51, 9—32).—Aetiological and clinical aspects are discussed.

F. O. H.

**Effect of administration of carotene and vitamin-A in diabetes mellitus. I. Effect of oral administration of carotene on blood-carotene and -cholesterol of diabetic and normal patients.** E. P. RALLI, H. BRANDALEONE, and T. MANDELBAUM (J. Lab. Clin. Med., 1935, 20, 1266—

1275).—Blood-carotene (I) increases in diabetes. Administration of carrots or (I) in oil produces a greater increase in blood-(I) in diabetics than in normal individuals. A second dosage to diabetics produces a greater increase than the first. Increased liver-(I) in diabetics is due to inability of the organ to convert (I) into vitamin-A. Absorption of (I) from the blood is thereby reduced. CH. ABS. (p)

Utilisation of fructose in diabetes. A. YOVANOVITCH (Compt. rend. Soc. Biol., 1937, **124**, 477—479).—Ingestion of fructose decreases the glucose and COMe<sub>2</sub> in the urine. H. G. R.

Adrenaline secretion in animals with experimental diabetes. J. M. ROGOFF and E. N. NIXON (Proc. Soc. Exp. Biol. Med., 1936, **35**, 257—259).—The diabetes is primarily responsible for reduction of adrenaline secretion, which can be raised by stimulation of the splanchnic nerve. P. G. M.

Endemic goitre in Langkloof valley. E. E. BUTTNER (S. African Med. J., 1935, **9**, 187—189).—Development of goitre is associated with deficiency of sunlight and vitamin-D and metabolism of I, Ca, P, and Fe. In studying dietary deficiency cooked and not raw foods should be examined for I. CH. ABS. (p)

Primary granulocytopenia due to hypersensitivity to amidopyrine. T. L. SQUIER and F. W. MADISON (J. Allergy, 1934, **6**, 9—16).—The disorder proceeded from use of amidopyrine alone or in combination with a barbiturate. CH. ABS. (p)

Blood-iron and -copper in hæmochromatosis. A. SACHS, V. E. LEVINE, and W. O. GRIFFITH (Proc. Soc. Exp. Biol. Med., 1936, **35**, 332—335).—Low vals. (89—74% of normal) for blood-Fe are recorded, possibly owing to retention of Fe in the tissues. There is no relation between Fe metabolism and blood-Cu in hæmochromatosis. P. G. M.

Resistance of vitamin-B<sub>1</sub>- and -B<sub>2</sub>-deficient and normal rats to intracerebral injection of herpes virus. E. V. COWDRY, A. M. LUCAS, and C. F. NEFF (J. Infect. Dis., 1935, **57**, 174—182).—Deficient rats were slightly the more sensitive. CH. ABS. (p)

Chemotherapy of infectious diseases. M. OESTERLIN (Klin. Woch., 1935, **14**, 1682—1684; Chem. Zentr., 1936, i, 1913).—A parallel is traced between therapeutic activity and fluorescence in anti-malarials and trypanocides. H. N. R.

Lipin-protein metabolism in infectious diseases. A. SARTORY, R. SARTORY, G. HUFSCHEMITT, and J. MEYER (Bull. Soc. Chim. biol., 1936, **18**, 1842—1849).—Determinations of the total amounts of any component of the lipin-protein complex do not permit any conclusion to be reached on the course of the infection. However, the ratios of serum-albumin (I):globulin (II), (I)-lipin:(II)-lipin, total fat:total protein, and (I)-cholesterol (III):(II)-(III), and the lipocytic index all assist in diagnosis of the stage of the disease. P. W. C.

Plasma-phosphatase in various kinds of jaundice. F. K. HERBERT (Brit. J. Exp. Path., 1935, **16**, 365—375).—Phosphatase determinations have a

supplementary val. in diagnosis. Phosphatase and directly-reacting bilirubin in sera do not show parallel variations. CH. ABS. (p)

Galactose-tolerance test as an aid to diagnosis in jaundice. E. H. BENSLEY (Canad. Med. Assoc. J., 1935, **33**, 360—363). CH. ABS. (p)

Mouse leucæmia. (i) Proleucæmic changes in lymphoid metabolism. (ii) Metabolism in spontaneous lymphatic leucæmia. J. VICTOR and J. S. POTTER (Brit. J. Exp. Path., 1935, **16**, 243—252, 253—265). CH. ABS. (p)

Relation of viscosity of blood to leucocyte count, with reference to chronic myelogenous leucæmia. D. J. STEPHENS (Proc. Soc. Exp. Biol. Med., 1936, **35**, 251—256).—High leucocyte counts in chronic myelogenous leucæmia are often responsible for an increase in blood  $\eta$  and prolongation of the circulation time. P. G. M.

Comparative therapeutic examination of ethylapoquinine and optoquin. E. ARJONA (Z. Immunitäts., 1935, **83**, 472—477; Chem. Zentr., 1936, i, 2587).—Ethylapoquinine was the more effective. A. G. P.

Blood-sugar curves in mental disorders. S. KATZENELBOGEN and W. S. MUNCIÉ (J. Nervous Mental Dis., 1935, **82**, 125—133).—Blood-sugar curves were not closely related to the various emotional reactions observed. CH. ABS. (p)

Biological relations in moniliasis of the skin and mucous membranes. P. NEGRONI (Folia biol., 1933, 134—135).—Agglutination tests are described. CH. ABS. (p)

So-called mosaic fungus as an intercellular deposit of cholesterol crystals. A. M. DAVIDSON and P. H. GREGORY (J. Amer. Med. Assoc., 1935, **105**, 1262—1264).—The mosaic associated with skin infections consists of aggregations of cholesterol crystals. CH. ABS. (p)

Alkalosis of blood in neoplasms and its diagnostic and pathogenetic importance. A. OSZACKI and R. KURZWEIL (Biochem. Z., 1937, **289**, 234—242).—Using an adapted H<sub>2</sub> electrode for determination of blood  $p_H$ , it is shown that alkalosis is almost always found in neoplastic diseases. In no case was acidosis or even normal val. reached. Alkalosis with vals. above  $p_H$  7.379 diagnosed tumours with 90% probability and below 7.36 excluded tumours with 95% probability. The vals. with serum do not give as clear-cut a picture as with whole blood. P. W. C.

Sphingomyelin from brain in Niemann-Pick disease. C. TROPP and B. ECKARDT (Z. physiol. Chem., 1937, **245**, 163—167; cf. this vol., 56).—The dry material from the brain of the case previously described yielded 0.7% of unidentified sugar, 1.6% of cerebrosides, and 3.6% of pure (13.4% of crude) sphingomyelin,  $[\alpha]_D +6.98^\circ$  in CHCl<sub>3</sub>-MeOH (1:1), which, on hydrolysis, gave palmitic, lignoceric, and stearic acids in the proportions 1:1.5:6. W. McC.

Experimental osteodystrophia fibrosa produced by parathyroid hormone and its relation to vitamin-D. T. PERRAS (Virchow's Arch., 1935,

296, 212—239; Chem. Zentr., 1936, i, 2767—2768).—Prolonged administration of parathormone induces osteodystrophia. Vitamin-D has a corrective action.  
A. G. P.

**Intestinal chemistry in pellagra.** A. SLATINEANU, I. BALTEANU, M. SIBI, and R. LEVIT (Compt. rend. Soc. Biol., 1937, 124, 392—394).—An increase in the intestinal  $p_H$  causes a decrease in the alkaline reserve of the blood, occurrence of albuminuria, and an increase in putrefactive flora and toxins.  
H. G. R.

**Auto-intoxication in pellagra.** A. SLATINEANU, I. BALTEANU, I. NITULESCU, M. FRANKE, M. SIBI, E. VEITH, and I. NAFTALIS (Compt. rend. Soc. Biol., 1937, 124, 395—397).—Toxic substances are absorbed into the blood due to a deficiency in the antitoxic power of the liver.  
H. G. R.

**Cinchona alkaloids in pneumonia. IV. Derivatives of ethylapocupreine [ethylapoquinine].**—See A., II, 171.

**Action of iodine compounds on bone calcification in experimental rachitic rats.** R. LECOQ and R. GALLIER (Bull. Sci. pharmacol., 1935, 42, 526—528; Chem. Zentr., 1936, i, 2583).—Supplementary feeding of KI or  $CaI_2$  increased calcification.  
A. G. P.

**Reduced ascorbic acid content of blood-plasma in rheumatoid arthritis.** J. F. RINEHART, L. D. GREENBERG, and F. BAKER (Proc. Soc. Exp. Biol. Med., 1936, 35, 347—350).—The intake of ascorbic acid required to maintain an average plasma level in arthritics is  $\gg$  average requirements in normal individuals.  
P. G. M.

**Reduced ascorbic acid content of blood-plasma in rheumatic fever.** J. F. RINEHART, L. D. GREENBERG, and A. U. CHRISTIE (Proc. Soc. Exp. Biol. Med., 1936, 35, 350—353).—In acute rheumatic fever the plasma level of reduced ascorbic acid is uniformly low, and usually responds to an increased intake.  
P. G. M.

**Scarlet fever toxin. I. Purification and concentration.** G. F. DICK and A. K. BOOR (J. Infect. Dis., 1935, 57, 164—173).—Highly potent preps. are obtained by fractional pptn. with  $(NH_4)_2SO_4$ , treatment with  $Al(OH)_3$ , dialysis, and evaporation.  
CH. ABS. (p)

**Histological effects of potassium iodide and thyroid substance on guinea-pig thyroid in experimental scurvy.** W. F. ABERCROMBIE (Amer. J. Path., 1935, 11, 469—481).—Administration of KI to scorbutic animals corrects pathological changes in the thyroid gland. Thyroid substance produces similar changes except that the epithelium is not flattened but returns to normal height. Neither KI nor thyroid substance prolongs the life of the animals. Vitamin-C is not concerned in I metabolism.  
CH. ABS. (p)

**Pathogenesis of scorbutic dystrophy.** P. ROHMER and N. BEZSSONOFF (Arch. Dis. Childhood, 1935, 10, 319—326).—In infants of age  $\geq 11$  months vitamin-C can be synthesised in the body. In scorbutic cases synthesis is inhibited by a pathological condition. In urine -C may be detected by the violet

coloration produced by treatment with monomolybdophosphotungstic acid in  $H_2SO_4$ . Pathological conditions are indicated by the absence of the colour reaction and the appearance of a greyish-white ppt. on addition of the reagent.  
CH. ABS. (p)

**Rôle of cholesterol and lecithin in the mechanism of the Bordet-Wassermann reaction. I.** ORNSTEIN, M. DRAGOS, and S. MUHLBERG (Compt. rend. Soc. Biol., 1937, 124, 398—400).—A diminution in blood-cholesterol and -lecithin occurs in secondary and latent syphilis, the ratio remaining unchanged.  
H. G. R.

**Chemotherapeutic action and carbohydrate metabolism. Curative effect of guanidine derivatives in trypanosome infection.** N. VON JANCÓ and H. VON JANCÓ (Z. Immunitäts., 1935, 86, 1—30; Chem. Zentr., 1936, i, 2587).—The therapeutic action of Synthalin or Synthalin B (deca- and dodeca-methylenediguamide) is delayed by splenectomy or by poisoning of the reticuloendothelial system with colloidal Cu. The effect of Synthalin is associated with hypoglycæmia which influences the sugar metabolism of the parasite. Insulin restricts the propagation of the trypanosomes.  
A. G. P.

**Mechanism of the iron-peptonate reaction proposed for diagnosis of Leishmania interna in children.** L. AURICCHIO and A. CHIEFFI (Pediatrics, 1935, 43, 745—750; Chem. Zentr., 1936, i, 2156).—The reaction is due to the increase of the euglobulin fraction in the serum.  
H. N. R.

**Cholesterol content of the tuberculous focus in kidney tuberculosis.** M. HASHIMOTO (Tôhoku J. Exp. Med., 1935, 26, 412—418).—In tuberculous kidney tissue the cholesterol content is  $>$  normal.  
CH. ABS. (p)

**Behaviour of blood-cholesterol level in some surgical diseases, particularly in kidney tuberculosis.** M. HASHIMOTO (Tôhoku J. Exp. Med., 1935, 26, 419—432).—In certain diseases significant changes in blood-cholesterol (I) are observed. No relation exists between (I) and blood-urea or red-cell sedimentation rates.  
CH. ABS. (p)

**Interrelationship of vitamin-A and glycuronic acid in mucin metabolism.** I. A. MANVILLE (Science, 1937, 85, 44—45).—The fundamental cause of ulcerative and erosive changes in the gastrointestinal mucosa appears to be due to the presence in the body of toxins so constituted that for their detoxication they must be conjugated with glycuronic acid. The demands for detoxication appear to take precedence over those for mucin production.  
L. S. T.

**Growth and decay.** F. BERNSTEIN (Cold Spring Harbor Symp., 1934, 2, 209—217).—A mathematical discussion of the chemistry of growth changes.  
CH. ABS. (p)

**Genetics of abnormal growth in guinea-pigs.** S. WRIGHT (Cold Spring Harbor Symp., 1934, 2, 137—147).—Specificity in gene action is always a chemical specificity and is probably related to the production of enzymes which control metabolism.  
CH. ABS. (p)

Body build factor in the basal metabolism of boys. M. MOLITCH (Amer. J. Dis. Children, 1935, 50, 621—625).—No relation was apparent between body build and  $O_2$  absorption in boys of 10—18 years.

CH. ABS. (p)

Respiratory metabolism in infancy. XV. Daily energy requirements of normal infants. S. Z. LEVINE, T. H. McEACHERN, M. A. WHEATLEY, E. MARPLES, and M. D. KELLEY (Amer. J. Dis. Children, 1935, 50, 596—620; cf. A., 1932, 1293).—Data for children aged 4—9 months are obtained.

CH. ABS. (p)

Respiratory metabolism of excised brain tissue. II. Effects of drugs on brain oxidations. S. B. WORTIS (Arch. Neurol. Psychiat., 1935, 33, 1022—1029).—Addition of glucose and Na lactate to fluid used for immersion stimulates respiration in excised brain and spinal cord tissues. Narcotics and hypnotics depress the R.Q. Insulin lowers  $O_2$  consumption by brain tissue.

CH. ABS. (p)

Action of glucose on respiratory exchange of adrenalectomised dogs. A. M. ELIZALDE (Rev. Soc. Argentina Biol., 1935, 11, 125—132).—After bilateral adrenalectomy basal metabolism decreased by 30—40% and the R.Q. decreased slightly. Intravenous injection of glucose (I) produced more prolonged hyperglycaemia than in normal dogs. Ingestion or injection of (I) caused a return to normal of basal metabolism and increased the R.Q.

CH. ABS. (p)

Respiratory metabolism of nerves with blocked conductivity. S. N. KAGANOVSKAJA (Biochimia, 1936, 1, 479—484).—The  $O_2$  consumption of frog nerves in which conductivity has been reversibly abolished by immersion in isotonic KCl is not increased by electric stimulation. The same effect is obtained when a portion of nerve between the electrodes is treated with KCl.

R. T.

Respiration and functional activity. W. DEUTSCH and H. S. RAPER (J. Physiol., 1936, 87, 275—286).—Respiration of submaxillary and parotid glands *in vitro* is increased by pilocarpine, eserine, and acetylcholine, the effect being inhibited by atropine. Secretin increases respiration of pancreatic tissue and loses this property when inactivated. Adrenaline increases respiration only in the submaxillary gland of the cat, and does not affect either gland of the dog or rabbit. EtOH extract of human saliva does not increase respiration of the submaxillary gland.

R. N. C.

Oxygen consumption and carbohydrate metabolism of the retractor muscle of the foot of *Mytilus edulis*. D. GLAISTER and M. KERLY (J. Physiol., 1936, 87, 56—66).—The muscle-carbohydrate is almost exclusively glycogen, and rises in winter; lactic acid (I) is low in the resting state.  $O_2$  consumption in sea- $H_2O-PO_4'''$  is steady at 12—25°, but is reduced at 7.5°, and at 37° it is increased but decreases after 3—4 hr. It is of the same order in sea- $H_2O-PO_4'''$  at  $p_H$  7.2 and unbuffered sea- $H_2O$  at  $p_H$  8.4, but is reduced in sea- $H_2O-PO_4'''$  at  $p_H$  6.6 or  $PO_4'''$  buffer alone at any  $p_H$ . It is unaffected by glucose (II) or (I), but is generally depressed by

$CH_2I \cdot CO_2H$  (III). (I) production is low and irregular in anaerobiosis; it is unaffected by (II), and inhibited by (III), NaF, and  $Na_2SO_3$ . Stimulation to fatigue increases (I) production, which is inhibited by (II). (I) production in summer is < in winter, both in anaerobiosis and after stimulation.

R. N. C.

Effect of partial salt deficiency on cell respiration. H. FRENKEL (Protoplasma, 1936, 25, 176—187).—Omission of Ca, K, or both from the surrounding Ringer solution greatly depressed respiration in various animal tissues. The effects varied with the state of nutrition of the tissue and were different in embryonic and mature tissues. Ba was an almost perfect substitute for Ca; Sr also increased respiration but Mg inhibited it.

M. A. B.

Embryonic biology. I. Anaerobiosis in petromyzonts and anurous amphibia. A. SPIRITO (Atti R. Accad. Lincei, 1936, [vi], 23, 907—911).—The retarding effects of  $O_2$  deprivation and of 0.001M-KCN on development are discussed.

F. O. H.

Respiration and system of respiratory enzymes of fatigued muscle. E. T. SORENI and O. P. TSCHERNOGA (Ukrain. Biochem. J., 1936, 9, 989—1004).—The  $O_2$  intake of fatigued rabbit muscle is 15% > for resting muscle, but is inhibited by HCN to the same extent in both cases. The flavin content of muscle is unaffected by fatigue. It is concluded that the state of the system of respiratory enzymes of muscle is independent of the physiological state of the muscle.

R. T.

Influence of exercise and training on the redox potential of muscle. IV. Redox potential and  $p_H$ . R. TSCHAGOVETZ (Ukrain. Biochem. J., 1936, 9, 1005—1016).—The  $p_H$  of rabbit muscle extracts (in phosphate buffer at  $p_H$  6.8) remain const. during 3 hr. (in vac.), whilst the  $E_H$  falls to a const. val., after which  $p_H$  begins to diminish. The  $p_H$  of white, but not of red, muscle extract or pulp rises after fatigue, whilst training leads to a fall in  $p_H$  in both red and white muscle.

R. T.

Influence of C-avitaminosis on redox processes (studied by Thunberg's method) in muscle, after fatigue and training. M. F. MERESHINSKI (Ukrain. Biochem. J., 1936, 9, 1017—1034).—The velocity of decoloration of methylene-blue (I) by resting is > by fatigued guinea-pig muscle; the effect is smaller when the exercise is preceded by a period of training. The decoloration of (I) is more rapid with resting trained than with untrained muscle. Analogous experiments performed on scorbutic animals indicated a lowered redox potential in all cases.

R. T.

Effect of variation in the atmospheric temperature on the respiratory quotient and the alkaline reserve of the tortoise. L. DONTCHOFF and C. KAYSER (Compt. rend. Soc. Biol., 1937, 124, 364—366).—If the external temp. is lowered to 5°, an increase in the alkaline reserve occurs. The val. for  $CO_2$  retained, calc. from the R.Q., is < that observed.

H. G. R.

Non-carbohydrate metabolism in connexion with the motility of mammalian spermatozoa. I. I. IVANOV (Biochimia, 1936, 1, 245—254).—The

R.Q. of motile sheep spermatozoa in carbohydrate-free media is 0.78, whilst in presence of glucose it is 1.0. The existence of non-carbohydrate sources of energy is postulated. R. T.

Significance of fumaric acid in the respiration of animal tissues. IV. I. BANGA and A. SZENT-GYORGYI (Z. physiol. Chem., 1937, 245, 113—122; cf. this vol., 59).—Extract of pigeon breast muscle contains fumaric dehydrogenase (I) which converts fumaric acid (II) into oxalacetic acid (III), exhibiting max. activity at  $p_H$  7.4. Activity of (I) is independent of the concn. of (II) but is increased by addition of codehydrogenase and  $PO_4'''$ . (I) accepts H also from lactic, glutamic (IV), and succinic (V) acid,  $AcCO_2H$ , (III), and hexose diphosphate. (III) inhibits the action of (I) but its effect is counteracted by adding (IV). Associated with (I) is an enzyme which causes intense  $O_2$  uptake in presence of  $p-C_6H_4(NH_2)_2$  or (V). The extract also contains a decarboxylase (VI) which converts (III) into  $AcCO_2H$  and  $CO_2$ . (VI) is most active at  $p_H$  6—7. With low (III) concns. the extent of decarboxylation is  $\propto$  the (III) concn. The extent of conversion of (III) into an equilibrium mixture of (II) and malic acid increases with  $p_H$ , reaching max. in feebly alkaline conditions, and is independent of the (III) concn. Production of the mixture decreases rapidly with time whilst decarboxylation continues. W. McC.

Glutathione concentration and hereditary size. IV. Effect of suckling. H. GOSS and P. W. GREGORY (J. Exp. Zool., 1935, 71, 311—316; cf. A., 1935, 1424).—Vals. were higher in suckled than in fasted rabbits, 50 hr. after birth. No differences in ascorbic acid contents were found. CH. ABS. (p)

Effect of diet on phosphorus and nitrogen compounds of muscle in fatigue. II. MEER S. MISCHKIS and MARIA S. MISCHKIS (Ukrain. Biochem. J., 1936, 9, 1035—1053; cf. A., 1935, 1521).—The phosphagen- and inorg. P contents of resting and fatigued (in parentheses) rat muscle are 0.0580 and 0.375 (0.0413 and 0.473), respectively, on a mixed diet, 0.0953 and 0.360 (0.0402 and 0.478) on a non-protein diet, and 0.0505 and 0.369 (0.0402 and 0.456) on a meat diet; the corresponding vals. for phosphagen- and total creatine are 0.242 and 2.26 (0.187 and 2.77), 0.388 and 2.58 (0.171 and 2.90), and 0.212 and 2.47 (0.168 and 2.69), for N content 13.6 (14.6), 14.2 (13.8), and 14.9 (13.4), and for  $H_2O$  content 75.5 (77.1), 76 (77.6), and 75.2 (75.6) g. per 100 g. The results indicate that the phosphagen content is highest on a protein-free diet in resting muscle, whilst fatigued muscles have the same val. irrespective of diet. R. T.

Influence of acidic and basic diets on the lactic acid content of muscle, and on its synthetic power in fatigue and training. A. V. PALLADIN and L. I. PALLADIN (Ukrain. Biochem. J., 1936, 9, 969—987).—The lactic acid content of fatigued muscle increases by 41 or 65% above, and the synthetic capacity for org. P compounds falls by 11 or 16% below, the resting val., in rabbits maintained for 15 days on an acid or basic diet, respectively. The synthetic capacity of fatigued muscle is unaffected

by previous training in the acid diet group, but is lowered in the basic group. R. T.

Effect of natural wines on composition of urine and alkali reserve of blood. J. H. FESSLER, E. M. MRAK, W. V. CRUESS, and J. J. HAYES (Z. Unters. Lebensm., 1936, 72, 461—463).—The daily ingestion of 12 oz. of red or white wine had no perceptible effect. E. C. S.

Excess of fats in the ration as a limiting factor in the growth of rats. R. LECOQ and M. ALLINNE (Ann. Falsif., 1936, 29, 539—545).—The growth of rats fed exclusively on plain or milk chocolate is retarded in proportion to the fat content of the chocolate, the rats appearing to suffer from avitaminosis-B even when yeast is added to the diet. Cacao butter may be replaced by butter fat without affecting the growth rate. Improved growth results from replacement of sucrose or lactose by maltose. E. C. S.

Influence of diet unbalanced with respect to carbohydrate on the composition of pigeon muscle. R. LECOQ and R. DUFFAU (Compt. rend., 1937, 204, 449—451).—On a diet with 66% of galactose, which leads ultimately to death in "polyneuritic" convulsions, breast muscle shows increases in total reducing sugar, lactic acid,  $PO_4'''$ , and total acid-sol. P and a decrease in adenylypyrophosphoric acid. R. M. M. O.

Effects of feeding stuffs on the pancreatic function of calves. N. POPOV, E. SCHMAKOVA, and V. KUZNEZOVA (Fiziol. Shur., 1934, 17, 52—62; Bied. Zentr., 1935, A, 6, 191).—Sunflower silage increases the quantity and alkalinity of pancreatic juice. Straw foods have the reverse effects. A. G. P.

Plant extracts in the nutrition of guinea-pigs and rabbits. A. G. HOGAN and S. R. JOHNSON (Proc. Soc. Exp. Biol. Med., 1936, 35, 217—221).—Rabbits and guinea-pigs were fed on a basal diet adequate for growth but insufficient during pregnancy and lactation. An EtOH extract of young cereal grasses (2%) with an Et<sub>2</sub>O extract of dried lucerne (1%) formed a supplement adequate for the maintenance of pregnancy; neither separately was sufficient. P. G. M.

Nutrient value of tree shoots. P. RAUSCHENBACH (Arb. Zootechn. Inst. Moscow, 1934, 1, 68—78; Bied. Zentr., 1935, A, 6, 194—195).—Starch equivs. and digestibility coeffs. of birch twigs are determined in trials with sheep. The food val. (notably crude protein) is  $>$  that of straw. A. G. P.

Consumption of different starches in nutritional tests with rats. J. A. F. KOK and J. BOUMAN (Acta. brev. neerland., 1935, 5, 111—115; Chem. Zentr., 1936, i, 2583).—Wheat, rice, and maize starches in amounts to provide 75% of the ration were satisfactorily utilised by rats and growth rates were similar for the three varieties. Similar proportions of potato starch caused early death. A. G. P.

Food relations of *Lyctus* powder-post beetles. E. A. PARKIN (Ann. Appl. Biol., 1936, 23, 369—400).—A substance sol. in  $H_2O$  at 60° is necessary for the

normal development of the larvæ. Development is prevented by absence of starch (I). Enzymes capable of hydrolysing (I), maltose, sucrose, lactose, and protein are present in the gut. Sugar, protein, and (I) are necessary food constituents for the larvæ, which may be reared on synthetic media in the absence of wood. A. G. P.

Effect of proteins of wheat endosperm on active metabolism. F. W. KAPING (*Z. Unters. Lebensm.*, 1936, 72, 453—457).—The proteins of the endosperm have approx. the same effect on the urinary quotient as has casein, but after prolonged feeding the quotient falls. E. C. S.

Biological differentiation of proteins of various parts of the wheat grain by means of the urinary quotient and its effect on active metabolism as compared with casein and ovalbumin. H. JORDAN (*Z. Unters. Lebensm.*, 1936, 72, 457—460).—The proteins of the embryo, the endosperm, and the bran affect the urinary quotient in rats to markedly different extents. As compared with casein, embryo- and bran- but not endosperm-protein cause a smaller loss of urinary N. Urinary C is decreased only by bran-protein. E. C. S.

Nutritive protein of some newly developed soya beans. A. A. O'KELLY, W. SMITH, and R. C. WILSON, jun. (*J. Tenn. Acad. Sci.*, 1935, 10, 175—178).—Substitution of soya-bean meal for casein in a mixed diet produced satisfactory growth in rats. Live-wt. increases varied with the variety of beans used. Roasting the meal at 150° for 30 min. improved the nutritive val. CH. ABS. (p)

"Lipotropic" effect of dietary protein. C. H. BEST, R. GRANT, and J. H. RIMOUT (*J. Physiol.*, 1936, 86, 337—342).—Casein (I) samples containing insignificant amounts of choline (II) prevent fat accumulation in the liver when fed to white rats, but gelatin exerts little or no effect. The "lipotropic" effects of (II) and an unidentified constituent of (I) cannot be differentiated. R. N. C.

Effect of muscular work on protein metabolism in ruminants. P. V. RAMIAH (*Proc. Soc. Biol. Chem. India.*, 1937, 1, 6—7).—In ruminants, muscular work is accompanied by protein breakdown even when there is an abundance of calorogenic material available. W. O. K.

Dependence of the action of supplementary administration of cystine in metabolism during work on the quality of the nutrition protein and its action in a protein-free diet. H. KROHN and W. BARWOLFF (*Biochem. Z.*, 1937, 289, 266—272).—Cystine (I) added to a diet containing caseinogen as the nutritive protein does not affect the urinary C : N quotient but leads to an increase of the vacate O : N ratio; when added to a diet containing lentil meal or potato protein it leads to an increase of both ratios. The decrease in wt. of rats on a protein-free but calorifically sufficient and otherwise complete diet cannot be avoided by addition of (I) to the diet. P. W. C.

Effect of the quality of different proteins on the oxidational level in intermediate metabolism. H. EWALD (*Biochem. Z.*, 1937, 289, 273—

275).—A table summarises the considerable changes of rat urinary C : N and vacate O : N ratios with change of the relative amounts of oatmeal and edestin in the diet. P. W. C.

Effect of high environmental temperature on cerebral nitrogen metabolism. S. E. EPELBAUM and MARIA S. MISCHKIS (*Ukrain. Chem. J.*, 1936, 9, 1055—1067).—The total N content of the cerebral cortex, mid-brain, and cerebellum of rabbits maintained at 40° for 3 hr. is slightly <, and the non-protein-N slightly >, those of control animals. R. T.

Metabolism of sulphur. XXIV. Metabolism of taurine, cysteic acid, cystine, and peptides containing these amino-acids. F. R. WHITE, H. B. LEWIS, and J. WHITE (*J. Biol. Chem.*, 1937, 117, 663—671).—Glycyltaurine (but not glycyl-cysteic acid) is hydrolysed by liver and kidney extracts (pig, rabbit). Peptides containing glycine and cystine are hydrolysed by enzymes of the alimentary canal, and the excretion of extra S after their oral or parenteral administration is similar to that following administration of the free sulphonic acids (I). The intestinal flora play a definite part in the metabolism of (I). P. G. M.

Sulphur metabolism in cystinuria. J. C. ANDREWS and A. RANDALL (*J. Clin. Invest.*, 1935, 14, 517—524).—The cystine (I) output is unchanged by administration of NaHCO<sub>3</sub> or Na citrate although daily dosage with alkali prevents deposition of (I) calculi. Glycine and glutamic acid given in equal amounts do not affect excretion of (I). Oral administration of *l*-(I) is followed by nearly complete oxidation of (I)-S. Oxidation of *dl*-(I) was less efficient. Cysteic acid is not oxidised by the normal or cystinuric organism. Administration of *dl*-methionine caused no significant increase in (I) excretion, no excretion of homocystine, but slight excretion of methionine. CH. ABS. (p)

Transformation of adenosinetriphosphoric acid in muscle. D. L. FERDMANN and O. FEIN-SCHMIDT [with M. T. DMITRENKO] (*Biochimia*, 1936, 1, 183—200).—Fatigue in isolated muscles or in the intact frog is associated with liberation of H<sub>4</sub>P<sub>2</sub>O<sub>7</sub> from adenosinetriphosphoric acid, and of H<sub>3</sub>PO<sub>4</sub> from phosphocreatine; the reverse changes take place during rest. Fatigued muscle contains appreciable amounts of adenylic acid, indicating that deamination to inosic acid does not take place immediately. Inosinetriphosphoric acid is not formed at any stage of the process of muscular activity. R. T.

Effect of diets low in choline. C. H. BEST, M. E. H. MAWSON, E. W. MCHENRY, and J. H. RIMOUT (*J. Physiol.*, 1936, 86, 315—322).—Diets low in choline (I) cause extensive deposition of neutral fat in the livers of white rats, the accumulation being greater when there is much fat in the diet. Cholesteryl esters are also slightly increased. Addition of <3 mg. of (I) daily to the diet inhibits fat deposition. With fat-rich diets (I) favours the rate of gain of body-wt. and general physiological condition of the animals. R. N. C.

Utilisation of *l*-carnosine by animals on a histidine-deficient diet. V. DU VIGNEAUD, R. H. SIFFERD, and G. W. IRVING, jun. (J. Biol. Chem., 1937, 117, 589—597).—Carnosine (I), administered orally or subcutaneously to rats on a histidine (II)-free diet, promotes normal growth. Metabolism of (I) probably involves hydrolysis with liberation of (II).

F. A. A.

Metabolic studies in phenylketonuria. L. PENROSE and J. H. QUASTEL (Biochem. J., 1937, 31, 266—274).—In a case of phenylketonuria, 1—1.5 g. of phenylpyruvic acid (I) was excreted in 24 hr., representing the incomplete metabolism of at least half of the phenylalanine in the daily protein intake. A rapid method for determination of (I) in urine is described. The effect of feeding alanine (II), tyrosine (III), *dl*- (IV), *l*- (V), and *d*-phenylalanine (VI), and (I) to normal and phenylketonuric patients on the rate of excretion of (I) was investigated. In phenylketonurics, excretion of (I) is increased by feeding (IV), (V), or (VI) to an equal extent. In normal cases, ingestion of (V) does not, but of (IV) and (VI) does, lead to a slightly increased excretion of (I). In phenylketonurics, the ratio of (I)/urea excreted is approx. const. and is increased by feeding (IV) but not by feeding (II) or (III); (III) appears to cause a slightly increased excretion of (I) but is for the most part normally metabolised. Feeding (I) causes a greater excretion of (I) in phenylketonurics than in control patients. The metabolic disturbance in phenylketonurics is due largely to a decreased rate of oxidation of the  $C_6H_5$  ring in (I). P. W. C.

Fission products of glutathione in living tissues and the relation of glutathione to proteolytic degradation in the spread of cancerous swellings. A. ROSENBOHM (Biochem. Z., 1937, 289, 279—287).—The degradation of glutathione (I) into SH-containing dipeptides was investigated in tissue pulp in terms of change of total reduction time and of colorimetrically determined SH val. (I) of kidney tissue is converted into glutamylcysteine and of other tissues into cysteinylglycine. When organ pulp is left in contact with dil. lactic acid, reduction times and SH vals. are increased. The former increase is due in part to degradation by cathepsin of protein with liberation of combined (I). Such proteolysis is much less in normal than in Jensen rat sarcoma tissue.

P. W. C.

Metabolism of glyoxaline. II. Comparative glyoxalinuria of carnivorous, herbivorous, and omnivorous animals. P. LELU (Bull. Soc. Chim. biol., 1936, 18, 1871—1884).—Urinary excretion of glyoxaline in herbivorous (rabbit, sheep) is that in omnivorous and carnivorous animals (pig, dog, rat) (cf. A., 1935, 389).

P. W. C.

Relation of glycine and serine to growth. R. H. MCCOY and W. C. ROSE (J. Biol. Chem., 1937, 117, 581—588).—Neither glycine nor serine is indispensable for the normal growth of rats.

F. A. A.

Oxidation of aliphatic amines by brain and other tissues. C. E. M. PUGH and J. H. QUASTEL (Biochem. J., 1937, 31, 286—291).—Sliced brain (guinea-pig, rat) cortex and rat's liver scarcely attack

$NH_2Me$ ,  $NH_2Et$ , and  $NH_2Pr$  but deaminate butyl-, amyl-, isoamyl- (I), and heptyl-amine. Guinea-pig's liver and, to a smaller extent, kidney deaminate  $NH_2Bu$  ( $AcCO_2H$  being produced by the liver) but scarcely attack  $NH_2Pr$ . Extracts of brain, liver, and kidney (not rat's kidney) deaminate amines. The respiration of brain cortex (in presence of glucose) is decreased by the higher amines but that of liver is increased by amines which undergo oxidation. Products of deamination of (I) by brain and liver are isoamyl alcohol (?) and a substance which yields a 2:4-dinitrophenylhydrazone. The system which deaminates amines is distinct from that which oxidises  $NH_2$ -acids. W. McC.

Formation of ammonia in the brain of hibernating animals. O. FEINSCHMIDT (Biochimia, 1936, 1, 450—456).—The total purine-N of cerebral tissue of ground squirrels is 25—32 mg. per 100 g., of which 24—34% is present in nucleosides and free purines, and the rest in nucleotides. During hibernation practically the entire nucleotide content is represented by adenylic acid, the content of which falls abruptly, with liberation of  $NH_3$ , immediately after awakening from the winter sleep, and then rises gradually to the original winter level. Adenosine-triphosphoric acid is absent at all stages. R. T.

Utilisation of amino-acids and fat by the mammalian heart. E. W. H. CRUICKSHANK and G. S. McCURE (J. Physiol., 1936, 86, 1—14).—The heart cannot utilise naturally- or non-naturally-occurring  $NH_2$ -acids (I) in the absence of sugar in the circulating blood. Insulin (II) does not affect (I) utilisation. In strictly aglycaemic conditions the heart with R.Q. 0.7 utilises only fat, which it apparently oxidises directly; cardiac glycogen is reduced by 30% in 3 hr. without (II), but is not utilised in its presence. R. N. C.

Lipin metabolism of birds. C. TARLAZIS and E. DIMITROPOULOS (Ann. Méd. vét., 1933, 78, 462—468; Bied. Zentr., 1935, A, 6, 182).—Resorbed fat expressed as % of ingested fat is characteristic for every fatty food. Data are given. A. G. P.

Effect of paprika on metabolism of fat. K. HORVATH (Orvosi Het., 1935, 79, 850—852).—The blood-fat curve reached max. 3—7 hr. after ingestion of 100 g. of lard. When paprika was fed with lard max. vals. were sometimes higher and sometimes lower but the increase began earlier and was maintained for a longer period. CH. ABS. (p)

Effect of cholesterol and choline on liver-fat. C. H. BEST and J. H. RIDOUT (J. Physiol., 1936, 86, 343—352).—Choline (I) added to the diet of rats with fatty livers induced by cholesterol (II) causes a fall in liver-glycerides (III) and cholesteryl esters (IV) if a relatively small daily dose of (II) is given, but if larger amounts of (II) are given, (IV) may show a temporary rise. (III) fall while (IV) are increasing, even when (I) is not given. When (II) feeding is discontinued, (I) accelerates the fall of (IV). The effect of (I) on (III) apparently precedes that on (IV), but large quantities of (III) may still be present in the liver when the action on (IV) has become demonstrable. R. N. C.

**Origin of cholesterol in the animal organism.** M. VANGHELOVICI and F. PARHON (Bul. Soc. Chim. Romania, 1936, 18, 107—115).—Perfusion *in vivo* of the liver, kidney, and spleen of dogs with squalene or, to a smaller extent, oleic acid, but not with squalene hexachloride, increases the cholesterol content. Sterols are formed in animal organisms from long-chain, preferably unsaturated, compounds.

R. S. C.

**Formation of glycogen in the liver of anaesthetised cats: specific dynamic action.** C. REID (J. Physiol., 1936, 87, 113—120).—Formation of liver-glycogen (I) occurs when glucose, lactic acid, glycerol, or alanine is infused slowly into a cat's vein. (I) is not increased during infusion of  $\text{EtCO}_2\text{H}$ , glutamic or aspartic acid, and is reduced by infusion of glycine. Chloralose anaesthesia does not prevent (I) formation. The increase in protein metabolism (lowering of  $\text{SO}_4^{''}$  excretion) and (I) formation by  $\text{NH}_2$ -acids cannot be correlated.

R. N. C.

**Breakdown of glycogen by the glycogenase of heart-muscle.** L. B. WINTER (Biochem. J., 1937, 31, 236—239).—The end product of the action of a glycerol extract of heart-muscle on glycogen was shown from its m.p., reducing power,  $\alpha$ , and phenylosazone to be chiefly glucose. A small amount of a second osazone was probably that of a trisaccharide but no intermediate formation of disaccharide could be detected.

P. W. C.

**Carbohydrate metabolism of the nervous system. I. Autolytic formation of acetaldehyde from monosaccharides by brain tissue.** S. V. FOMIN and P. M. GUTNITZKAJA (Ukrain. Biochem. J., 1936, 9, 1069—1084).—*In-vitro* production of  $\text{MeCHO}$  by brain tissue from added carbohydrates is considerable in the cases of glucose and fructose, small in that of galactose, and absent in that of mannose.

R. T.

**Metabolism of *d*-xylulose.** H. W. LARSON, N. R. BLATHERWICK, P. J. BRADSHAW, M. E. EWING, and S. D. SAWYER (J. Biol. Chem., 1937, 117, 719—725).—*d*-Xylulose fed to rats increased liver-glycogen and, given subcutaneously or intraperitoneally, produced a slight increase in liver- and a significant decrease in muscle-glycogen. No changes were observed in liver- and muscle-lactic acid nor in the content of fermentable and non-fermentable reducing substances of liver, muscle, and kidneys when the sugar was fed or injected.

P. W. C.

**Phloridzin. VII. Effect on absorption of carbohydrates from the small intestine.** T. YOSHIKAWA. **VIII. Effect on sugar excretion in rabbits.** K. KURIHARA (Sei-i-Kwai Med. J., 1935, 54, No. 2, 75—103, No. 3, 51—61).—VII. The order of absorption of monosaccharides from jejunum loop of normal rabbits is: galactose, glucose, mannose, xylose, arabinose, fructose. Retardation of absorption of glucose by phloridzin (I) is  $>$  that of fructose.  $\text{H}_2\text{O}$ ,  $\text{NaCl}$ , and urea are unaffected. 0.05% aq.  $\text{NaF}$  inhibits absorption of  $\text{NaCl}$  but not that of sugar; simultaneous use of (I) under these conditions does not affect sugar absorption.

**VIII. (I) lowers the renal threshold for parenterally administered glucose and sucrose.**

CH. ABS. (p)

**Limiting rate of assimilation of glucose introduced intravenously at constant speed in the resting dog.** M. WIERZUCHOWSKI (J. Physiol., 1936, 87, 311—335).—The glycosuria curve shows a max. in the first 3 hr. of infusion, becoming almost linear and rising slightly in the second 3 hr. Above a rate of 5 g. per kg. per hr. the max. becomes only a delayed increase, whilst at 9 g. glycosuria falls after reaching a max. in the 5th hr. The % of glucose (I) assimilated falls linearly as the rate of infusion rises. As the rate of infusion is increased, the % of the increment that is utilised falls, until at rates  $>7$  g. each additional g. is almost entirely eliminated in the urine. The diuresis curves resemble the glycosuria curves in showing max. in the first 3 hr., which, however, become more prominent as the rate increases; they rise in the second 3 hr., except that at 8 g. which falls. The % of diuresis due to glycosuria is approx. const. The mean increases of diuresis over basal rate and glycosuria with the rate of infusion are approx. linear. The blood-(I) curves show max. in the first hr. up to 5 g., and afterwards become flat for the second 3 hr.; above 5 g. the max. disappears and the curves become steadily steeper and straighter. The mean blood-(I)-rate of infusion curve is a parabola. The % of the total (I) injected that remains in the organism after infusion rises with the rate of infusion, whilst the % of this that is assimilated falls, both curves being linear. The assimilation rate increases rapidly with the rate of infusion to reach an approx. steady max. at 4—5 g. Dilution of the blood increases in the first hr., the rise being more intense with high rate of infusion, and then falls steadily, except at 8—9 g. when a second rise occurs in 4 hr. The glycosuric ratio— $\text{increase in rate of glycosuria}/(\text{I increase})$ —increases with the rate to a max. at 4 g. and then falls, both branches of the curve being linear. The “incremental glycosuric ratio”— $\text{increment of glycosuria per g. increase of (I) supply}/\text{corresponding (I) increase}$ —is const. for all rates of infusion.

R. N. C.

**Deuterium as an indicator in the study of intermediary metabolism. VIII. Hydrogenation of fatty acids in the animal organism.** D. RITTENBERG and R. SCHOENHEIMER (J. Biol. Chem., 1937, 117, 485—490; cf. A., 1936, 1547).—Following the feeding of D-containing unsaturated fatty acids, the corresponding D-containing saturated acids can be isolated from mice, and *vice versa*. Hence saturation and desaturation of fatty acids in the organism is a reversible process.

R. M. M. O.

**Metabolism of dicarboxylic acids.** K. BERNHARD and M. ANDREAE (Z. physiol. Chem., 1937, 245, 103—106; cf. Flachentrager *et al.*, A., 1936, 510).—Orally administered adipic and succinic acids are almost completely and sebacic and suberic acids very incompletely oxidised in the body.

W. McC.

**Modification of the ratio between anaerobic glycogenolysis and the formation of lactic acid.** R. LIPPMANN and J. WAJZER (Compt. rend. Soc.

Biol., 1937, **124**, 538—539).—Production of lactic acid in frog's muscle is increased by  $K^+$  and decreased by  $PO_4'''$  or an increase in acidity, glycogenolysis not being affected in the latter case. H. G. R.

**Significance of liver in the metabolism of lactic acid.** I. OHASHI (Japan. J. Gastroenterol., 1935, **7**, 88—103).—Normal livers perfused with lactic acid (I) split the *d*- more readily than the *dl*-form. Impaired livers (e.g., with  $CHCl_3$ ) show decreased utilisation of (I). CH. ABS. (p)

**Certain metabolites and related compounds as precursors of endogenous citric acid.** J. M. ORTEN and A. H. SMITH (J. Biol. Chem., 1937, **117**, 555—567).—Of 22 substances intravenously injected into dogs, several, including  $NaHCO_3$  and  $NaOAc$ , produce small increases in urinary excretion of citric acid (I) ("alkali effect"), but  $Na_2$  malonate, succinate, fumarate, malate, and maleate increase (I) excretion 30—120 times. Moderate increases in urinary  $pH$  are also observed with both types of injected substance. The excreted (I) appears to be derived from the substances injected. F. A. A.

**Effects of hydroxymalonate on the metabolism of brain.** M. JOWETT and J. H. QUASTEL (Biochem. J., 1937, **31**, 275—281).—Added  $Na$  hydroxymalonate (I) restricts the oxidation of lactic acid (II) by slices of rat's and guinea-pig's brain more than it restricts that of glucose (III) and scarcely restricts that of  $AcCO_2H$  (IV); at least part of the (III) of brain is therefore degraded by a process in which (II) is not an intermediary. (I) also inhibits anaerobic decomp. of (IV) by brain and anaerobic glycolysis in brain in presence or absence of (IV). The respiration of brain in the absence or presence of  $\alpha$ -glycerophosphate is not increased by addition of phosphoglycerate. The red colour produced on dissolving the 2:4-dinitrophenylhydrazone in aq. alkali affords a method of determining (IV). W. McC.

**Brain metabolism. II. Production of succinic acid.** H. WEIL-MALHERBE (Biochem. J., 1937, **31**, 299—312; cf. A., 1936, 631).—Stable standardised sp. succinic dehydrogenase (I), prepared from ox heart by a method described, is used for the determination of succinic acid (II). (I) contains enzymes which dehydrogenate *d*(-)-glutamic acid,  $\alpha$ -glycerophosphate, and *l*- $\alpha$ -hydroxyglutaric acid but in relatively much smaller amounts. Malonic acid (III),  $\alpha$ -ketoglutaric acid (IV), pyocyanine, and phenosafuranine inhibit the action of (I), (IV) specifically restricting the action by about 50%. Anaerobic production of (II) from  $AcCO_2H$  and (IV) occurs in sliced and minced brain, and aerobic production from  $AcCO_2H$ , (IV), and (occasionally)  $AcOH$  in minced brain containing added (III). Addition of (III) does not cause accumulation of (II) in sliced brain and causes accumulation in minced brain only when (III) is used in certain concns. Minced brain produces small amounts of a volatile acid, probably  $AcOH$ , from  $AcCO_2H$ . W. McC.

**Influence of bone marrow on contents of inorganic salts in blood and urine in splenectomised rabbits.** H. KANEKO (Sei-i-Kwai Med. J., 1935, **54**, No. 3, 42—50).—Inorg. salt metabolism

modified by splenectomy is compensated by administration of bone marrow. CH. ABS. (p)

**Metabolism of inorganic salts and water in hepatic disturbances. III. (i) Metabolism of inorganic salts. (iii) Perfusion of extirpated liver. IV. (ii) Metabolism of water.** H. SHIGEMI (Japan. J. Gastroenterol., 1935, **7**, 104—110, 111—114; cf. A., 1936, 1141).—III. Rabbit livers, injured with  $CCl_4$  and then perfused with  $CaCl_2$ ,  $MgCl_2$ ,  $KCl$ , and  $NaCl$ , fixed subnormal amounts of cations in each case.

IV. Liver damage increases the amount of  $H_2O$  in liver, kidneys, intestine, and brain. CH. ABS. (p)

**Chlorine content of the albino rat in relation to age.** A. SALVATORI (Atti R. Accad. Lincei, 1936, [vi], **24**, 93—97).—Total Cl (determined after incineration with alkali) in albino rats fed on mixed diet after weaning falls by about one third in the first month, and then slowly until Cl (expressed as  $NaCl$ ) — about 0.2% of body-wt. E. W. W.

**Maternal transference of fluorine.** M. M. MURRAY (J. Physiol., 1936, **87**, 388—393).—Litters from pregnant rats fed with 0.05% of  $NaF$  acquire significant amounts of F. F is also transmitted to young rats suckled by mothers receiving  $NaF$ . Mottling of temporary teeth in man probably results from maternal fluorosis, and in places where the  $H_2O$  supply contains F it reaches human milk in quantities that are effective biologically although chemically and spectroscopically undetectable. R. N. C.

**Rat incisor as index of calcium metabolism.** I. SCHOUR (J. Amer. Coll. Dentists, 1934, **1**, 49).—Calcification occurs during the action of an excessive dose of ergosterol, of multiple injections of parathyroid hormone, and of injected  $NaF$ . CH. ABS. (p)

**Absorption of iron by ileum-fistula dogs.** A. SCHEUNERT and J. BRUGGEMANN (Ber. Verh. Sachs. Akad. Wiss. math-phys. Kl., 1935, **87**, 171—178; Chem. Zentr., 1936, i, 2387).—Reduced Fe which is readily transformed into  $Fe^{II}$  salts is more easily resorbed in the stomach and intestine than is colloidal  $Fe(OH)_3$ ,  $Fe$  saccharate, or  $Fe$ -albumin preps. A. G. P.

**Egg yolk and bran as sources of iron in the human dietary.** E. McC. VAHLTEICH, E. H. FUNNELL, G. MACLEOD, and M. S. ROSE (J. Amer. Dietet. Assoc., 1935, **11**, 331—334).—Egg yolk and bran were equally efficient as sources of Fe for young women. CH. ABS. (p)

**Biological significance of manganese.** F. MARZETTI (Rass. Clin. Terap. Sci., 1935, **34**, 271—285; Chem. Zentr., 1936, i, 1909).—Mn is resorbed in the animal organism and takes part in metabolic processes although the amounts ingested and eliminated may be equal. A. G. P.

**Secretion of calcium carbonate by hermetically sealed *Venus mercenaria*.** L. P. DUGAL and L. IRVING (Compt. rend. Soc. Biol., 1937, **124**, 526—528).—During cessation of normal respiration, secretion of  $CaCO_3$  into the fluid in the mantle cavity neutralises the acids produced by metabolism. H. G. R.

Renal elimination of phenol-red in the dog. H. L. SHEEHAN (J. Physiol., 1936, 87, 237—253). R. N. C.

Elimination of phenol by animals receiving autoclaved food. W. DUCE (Biochim. Terap. sperim., 1933, 20, 81—93; Chem. Zentr., 1936, i, 2765).—With an autoclaved diet 28—35% of subcutaneously administered PhOH appeared in urine in a combined form. With normal food 44—55% was eliminated in this form. A. G. P.

Conjugation of phenol [by tissues]. G. BARAC (Compt. rend. Soc. Biol., 1937, 124, 264—266).—This is not an exclusive function of the liver but is possessed by other tissues to a similar degree. H. G. R.

Mercapturic acid synthesis in animals. II. Rôle of bile in absorption and detoxication of bromobenzene and naphthalene in the dog. J. A. STEKOL and F. C. MANN (J. Biol. Chem., 1937, 117, 619—627).—The presence of a biliary fistula does not affect the synthesis of *p*-bromophenyl- and 1- $\alpha$ -naphthyl-mercapturic acids, although the biliary output of taurocholic acid is diminished, probably owing to liver injury rather than removal of cystine for detoxication. P. G. M.

Transformation of dehydrodeoxycholic acid into  $\alpha$ - and  $\beta$ -3-hydroxy-12-ketocholanic acid in the organism of the toad.—See A., II, 150.

Chemical and physical basis of pharmacological action. A. J. CLARK, W. STRAUB, R. A. PETERS, J. H. QUASTEL, H. R. ING, J. H. GADDUM, W. YORKE, and J. F. DANIELLI (Proc. Roy. Soc., 1937, B, 121, 580—609).—A discussion. F. O. H.

Emission of a radiation by the eggs of *DiscoGLOSSUS* during development. M. M. R. LEVY and R. AUDUBERT (Protoplasma, 1936, 25, 25—31).—The radiation has  $\lambda$  2000—2500 Å. and its intensity is approx. the same as that of Hg radiation of 2537 Å. The magnitude for 25 eggs is  $10^{-8}$ — $10^{-9}$  erg-sec. per sq. cm. or 100—1000 photons per sec. per sq. cm. M. A. B.

Effects of X-irradiation on cell growth and structure. G. L. CLARK (Cold Spring Harbor Symp., 1934, 2, 249—263).—Effects on bacterial cells and on animal tissues are discussed. Catabolic changes produced by X-rays and by cancer growth are considered. CH. ABS. (p)

Chemical-physical foundation of biological activities of X-rays. H. FRICKE (Cold Spring Harbor Symp., 1934, 2, 241—248).—Changes effected in cellular substances are discussed. CH. ABS. (p)

Effect of X-rays on the anterior pituitary. (Pozn. Towarz. przyj. Nauk Prace Komis. 5, No. 1, 1—134; Chem. Zentr., 1936, i, 2380).—Three stages of tissue injury are described. In women, but not in rabbits, a positive hormone-A test was obtained after irradiation of the pituitary.

Physicochemical basis of biological radiations. Spring Harbor Symp., 1934, 2, 226.—Weak ultra-violet radiations ( $\lambda$  < 2650 Å.) emitted during certain chemical reactions increase

the growth rate of onion root tips, bacteria, and yeasts. In senility and carcinoma human blood fails to produce these radiations. Curative effects of the rays are considered. CH. ABS. (p)

Biological action of sound of high pitch. F. FORSTER and A. HOLSTE (Naturwiss., 1937, 25, 11—12).—Ultra-short waves decrease the amplitude and increase the rate of the cold-blooded heart as a result of an unknown action on the cells. The effect is not entirely reversible and is therefore not thermal. The influence on *B. coli* is variable. J. L. D.

Release of acetylcholine at voluntary motor nerve-endings. H. H. DALE, W. FELDBERG, and M. VOGT (J. Physiol., 1936, 86, 353—380).—Acetylcholine is liberated from a perfused voluntary muscle by stimulation of the motor nerve fibres, and by direct stimulation from a normal or autonomically denervated muscle, but not from a completely denervated muscle. Liberation from perfused muscle is not inhibited by curarine, but it is inhibited by exhaustion of the motor nerve fibres by repeated stimulation. R. N. C.

One-way permeability. I. Is frog skin permeable to water in one direction only? D. L. RUBINSTEIN and T. MISKINOVA (Protoplasma, 1936, 25, 56—68).—Accurate measurements with the differential osmometer gave no indication of a physiological one-way permeability of frog skin to H<sub>2</sub>O. Movement of H<sub>2</sub>O through the skin followed the ordinary laws of osmosis. M. A. B.

Permeability of cells of tissues grown *in vitro*. H. GROSSFELD (Atti R. Accad. Lincei, 1936, [vi], 23, 904—906).—NH<sub>3</sub> penetrates into the cells slowly, NaHCO<sub>3</sub> more slowly, and NaOH and KOH not at all. NH<sub>4</sub>Cl and Na<sub>3</sub>PO<sub>4</sub> penetrate (and then rapidly) only in absence of electrolytes in equilibrium with the cells. In absence of electrolytes, urea penetrates more rapidly than glucose. F. O. H.

Comparative permeability to alcohol of the intact and the living, skinned frog. G. FONTES (Compt. rend. Soc. Biol., 1937, 124, 358—361).—When the skin is removed, the permeability of the animal for water and EtOH is increased but not to the same degree. H. G. R.

Comparative permeability towards alcohol of the isolated skin of the frog and collodion membranes. G. FONTES (Compt. rend. Soc. Biol., 1937, 124, 361—363).—If collodion sacs are dried, the permeability to EtOH is very low and increases with use. The results do not support the bound H<sub>2</sub>O theory of Nicloux (A., 1934, 445). H. G. R.

Effect of hydrogen-ion concentration on induction of polarity in *Fucus* eggs. I. Increased hydrogen-ion concentration and intensity of mutual inductions by neighbouring eggs of *Fucus furcatus*. D. M. WHITAKER (J. Gen. Physiol., 1937, 20, 491—500).—In sea-H<sub>2</sub>O at  $p_H$  6.0 mutual influence of neighbouring eggs on polarity of development is increased, possibly through local concn. of an acid active in undissociated form. The fact that large masses show the influence in normal

sea- $H_2O$  whilst isolated eggs do not is attributed to local lowering of  $p_H$  in such masses. R. M. M. O.

**Salt effect and medium in *Artemia salina*, L.; antagonism.** L. G. M. BAAS-BECKING, W. K. H. KARSTENS, and M. KANNER (Protoplasma, 1936, 25, 32—40).—The effect of different combinations and concns. of NaCl,  $CaCl_2$ , and  $MgCl_2$  on development of *A. salina* eggs is expressed in triangular diagrams. Sensitivity to  $Mg^{++}$  and  $Ca^{++}$  increases with increasing total concn.  $>0.8M$  and  $<0.2M$ . At  $3.5M$  and  $0.02M$  growth occurs only in pure NaCl solution. Between  $0.2$  and  $0.8M$  variations in total concn. have no effect. M. A. B.

**Comparison between the action of carbonic acid and that of other acids on the living cell.** Z. E. BECKER (Protoplasma, 1936, 25, 161—175).— $CO_2$ , AcOH, and  $BuCO_2H$  are much more toxic to plant and animal cells than are  $H_2SO_4$ , HCl,  $H_3PO_4$ ,  $H_2C_2O_4$ , and citric acid. The differences in toxicity depend on rate of penetration into the cell and concn. of undissociated mols. but not on  $p_H$ .  $CO_2$  differs from other acids in producing narcosis. M. A. B.

**Biological effects of beryllium.** R. N. LOOMIS and E. BOGEN (Amer. Rev. Tuberc., 1935, 32, 475—480).—Injection of Be as basic tartrate or chloride accelerated the development of experimental tuberculosis. Oral administration was not effective. Be rickets (Guyatt *et al.*, A., 1933, 1323) was not observed in rats. CH. ABS. (p)

**Effect of the high calcium content of *Cynara cardunculus*, L., and *Silybum Marianum*, L., on milk.** L. ECHENIQUE (Compt. rend. Soc. Biol., 1937, 124, 589—590).—These plants contain 1.7—2.2 and 4.19 mg. of CaO per 100 g. of dry matter, respectively; when fed to cows the Ca content of the milk increases and the milk gives a positive EtOH test. H. G. R.

**Role of calcium in imbibition in certain natural organic colloids.** D. KOHLER (Compt. rend. Soc. Biol., 1937, 124, 618—620).—Imbibition by *Laminaria flexicaulis* in aq.  $Na_2CO_3$   $\propto$  the time after previous treatment with  $CaCl_2$ , whilst after treatment with other electrolytes the curve becomes steady after rapidly rising to a max. H. G. R.

**Effect of potassium on the excitability and resting metabolism of frog's muscle.** D. Y. SOLANDT (J. Physiol., 1936, 86, 162—170).—Resistance to production of inexcitability of muscle in Ringer's solution by increased  $[K^+]$  shows a seasonal variation, being increased in winter. Resting heat production increases with  $[K^+]$  to a steady max. at 10 times the normal  $[K^+]$ , the increase being reversible; it shows no seasonal variation. The max. resting heat production occurs 2—3 hr. after application of the  $K^+$  solution, a slow fall following.  $Ca^{++}$  (in Ringer proportion) and  $Sr^{++}$  oppose the action of  $K^+$  on resting metabolism, whilst  $Rb^+$  and  $Ba^{++}$  act similarly to  $K^+$ ;  $Ba^{++}$  is toxic in high concn. Glucose and sucrose increase resting metabolism, but acetylcholine,  $CH_3I \cdot CO_2Na$ , and curare-like substances, with or without  $K^+$ , are without effect. Resting metabolism is also unaffected by change of  $p_H$  or osmotic pressure of the Ringer solution. R. N. C.

**Potassium changes in the stimulated superior cervical ganglion.** M. VOGT (J. Physiol., 1936, 86, 258—263).— $K^+$  is decreased by prolonged stimulation of the preganglionic fibres in the dog. It is unaffected by direct stimulation if the ganglion has previously been denervated. R. N. C.

**Action of potassium on the superior cervical ganglion of the cat.** G. L. BROWN and W. FELDBERG (J. Physiol., 1936, 86, 290—305).— $K^+$  liberates acetylcholine (I) from the normally innervated ganglion, but only insignificant amounts from the completely denervated ganglion, since denervation reduces the normal (I) content. (I) is also liberated by  $Rb^+$  and  $Cs^+$  (weakly), but not by  $Na^+$  or  $Ca^{++}$ ,  $Ca^{++}$  inhibiting (I) liberation by  $K^+$ . R. N. C.

**Liberation of acetylcholine by potassium.** W. FELDBERG and J. A. GUIMARAIS (J. Physiol., 1936, 86, 306—314).—KCl injected intra-arterially in dogs and cats liberates acetylcholine from the salivary and sweat glands and the tongue. R. N. C.

**Chemo-physiological activity of potassium and the protoplasm apparatus.** L. LOEW (Biochem. Z., 1937, 289, 176—178). P. W. C.

**Effect of iodine prophylaxy on the thyroid gland of the new-born.** B. STEINMANN (Endokrinol., 1936, 16, 395—411; Chem. Zentr., 1936, i, 2762).—Administration of iodised salt decreased the wt. of the thyroid in the new-born and diminished the frequency of congenital scrofula. A. G. P.

**Presence of heavy metals, especially copper, in organs of females of *Bonellia viridis*, extracts of which favour the development of males from indifferent larvæ.** F. MUTSCHER (Biol. Zentr., 1935, 55, 615—625; Chem. Zentr., 1936, i, 2378).—It is unlikely that Cu is the active agent, causing development of males from larvæ. A. G. P.

**Fate of thorium dioxide (thorotrast) in cerebral arteriography.** D. W. C. NORTHFIELD and D. S. RUSSELL (Lancet, 1937, 232, 377—381).—Evidence has been obtained of retention of  $ThO_2$  in the lumen or walls of cerebral vessels or in perivascular macrophages. L. S. T.

(A) Cellular reaction to silica. (B) Tissue reaction to sericite. J. T. FALLON and F. G. BANTING (Canad. Med. Assoc. J., 1935, 33, 404—407, 407—411).—(A) Subcutaneous injection of particulate quartz into rabbit ears caused inflammation and later the formation of fine hyalinised nodules.

(B) Introduction of aq. suspensions of finely-divided sericite into lungs or injection into ears of rabbits produced histological changes resembling those obtained with Si, mica, and  $BaSO_4$  but not those with  $SiO_2$ . CH. ABS. (p)

**Chemical changes in blood of animals in acute ammonia poisoning.** G. J. FAZEKAS (Magyar orvosi Arch., 1935, 36, 285—295; Chem. Zentr., 1936, i, 2388).—Blood changes in  $NH_3$  poisoning in many respects resemble those in diabetes mellitus, and include hyperglycæmia, increased serum-inorg. P, diminution in -Ca and alkali reserve, and shifting of serum- $p_H$  towards the acid side. A. G. P.

**Action of some -onium salts on the indirect sensitivity to stimulation of rabbit muscle.** G. BARTORELLI (Arch. ital. Biol., 1935, 93, 170—174; Chem. Zentr., 1936, i, 2136).—The inhibitory action of the salts was in the order,  $\text{NMe}_4\text{I} > \text{C}_8\text{H}_{17}\cdot\text{NMe}_3\text{I} > \text{strychnine methiodide} > \text{NMe}_4\text{Cl}$ . The action is more rapid in warm- than in cold-blooded animals.

A. G. P.

**Influence of some -onium salts on glycæmia. Tetramethylammonium-hyperglycæmia.** B. TANZI (Arch. ital. Biol., 1936, 93, 175—182; Chem. Zentr., 1936, i, 2136).—Of the salts examined (cf. preceding abstract), only  $\text{NMe}_4\text{I}$  produced hyperglycæmia in rabbits. This effect is prevented by ergotamine but is unaffected by insulin. A. G. P.

**Specific chemical factors influencing growth and differentiation.** F. GUDERNATSCHE (Cold Spring Harbor Symp., 1934, 2, 94—105).—The effects of various  $\text{NH}_2$ -acids are examined. CH. ABS. (p)

**Potential and respiration of frog's skin. I. II. Effect of homologous carbamates and certain lysins.** E. PONDER and J. MACLEOD (J. Gen. Physiol., 1937, 20, 433—447).—Et, Pr, Bu, and amyl carbamates depress  $\text{O}_2$  consumption of frog skin in Ringer's solution to extents which increase with concn. Curves relating depression of p.d. across skin and concn. of carbamate are different in form from those for  $\text{O}_2$  consumption. Ratios of isoactive concns. do not obey Traube's rule. Adsorption isotherms are given. Saponin and bile salts completely abolish p.d. but have no lasting influence on  $\text{O}_2$  consumption. Heterogeneity of the material must be considered in interpreting these results.

R. M. M. O.

**Action of the two optical isomerides of 3-diethylaminomethylbenzodioxan on aqueous diuresis.** E. ZUNZ and O. VESSELOVSKY (Compt. rend. Soc. Biol., 1937, 124, 282—284).—The *l*- has a greater antidiuretic action than the *d*-isomeride. H. G. R.

**Mode of action of methyloctenylamine hydrochloride (octinum).** K. SAMAAAN and K. SAAD (Quart. J. Pharm., 1936, 9, 647—658).—The intralymphatic (toad) and intravenous (dog) min. lethal doses are 0.2 and 0.025 g. per kg., respectively. In its general pharmacological action, the drug has the sympathomimetic properties characteristic of primary and sec. amines and of adrenaline. F. O. H.

**Pharmacology of ethylene glycol.** M. A. MANCINI (Boll. soc. ital. Biol. sperim., 1935, 10, 964; Chem. Zentr., 1936, i, 2136).—No toxic action follows use of the solvent in therapy. A. G. P.

**Physiological effect of diethylene glycol. II. Toxicity and fate.** H. B. HAAG and A. M. AMBROSE (J. Pharm. Exp. Ther., 1937, 59, 93—100).—Lethal dosages of diethylene glycol (I) for white rats and rabbits are determined. Rats receiving 1% and 0.3% of (I) in their drinking  $\text{H}_2\text{O}$  showed a slight enhancement of growth and an increased urinary excretion of  $\text{H}_2\text{C}_2\text{O}_4$ . In dogs, the urinary  $\text{H}_2\text{C}_2\text{O}_4$  is insignificantly increased and much of the (I) is eliminated unchanged. P. W. C.

**Influence of two war vesicants and their products of hydrolysis on the interfacial tensions**

of lipins with respect to physiological serum, as well as on their hydrophilism. A. KLING and G. LECORDIER (Compt. rend., 1936, 203, 1544—1546; cf. A., 1934, 216).—Cholesterol forms no compounds with yperite (I) and lewisite (II). (I) and (II) both increase the interfacial tension of lipins with respect to physiological serum and decrease the hydrophilism. Thiodiglycol [hydrolysis product of (I)], which has no vesicant action, lowered the tension and increased the hydrophilism, whilst  $\beta$ -chlorovinylarsine [hydrolysis product of (II)] which still possesses vesicant action, had an effect on lipins similar to, but less pronounced than, that of (II).

J. N. A.

**Pharmacology of camphor. II. Action of camphor and epicamphor on the smooth muscle of leeches and on the morphine-affected respiration of rabbits.** F. REINARTZ (Praktika, 1935, 10, 323—333; Chem. Zentr., 1936, i, 2387).—Camphor and epicamphor (I) produced substantially the same effects on muscle. (I) was the more active in increasing respiratory frequency. A. G. P.

**Prevention of compressed-air illness.** G. W. M. BOYCOTT (J. Hyg., 1935, 318—326).—The  $\text{CO}_2$  tension in subcutaneous tissue decreased and that of  $\text{O}_2$  increased after saponin foam baths. Gases do not diffuse through the skin. CH. ABS. (p)

**Benzene poisoning and vitamin-C.** A. MEYER (Z. Vitaminforsch., 1937, 6, 83—86).—Chronic  $\text{C}_6\text{H}_6$  poisoning in man is accompanied by increased utilisation of vitamin-C, the symptoms including those of avitaminosis-C. F. O. H.

**Pharmacology of dibromcholesterol.** P. PIRONE (Arch. Farm. sperim., 1936, 62, 176—186).—Subcutaneous administration of dibromcholesterol daily for 9—40 days into rabbits is followed by the occurrence of Br in the blood, liver, kidney, striated muscle, lung, heart, thyroid, adrenal, and (after >30 days' injection) brain, but not in the spleen.

F. O. H.

**Effect of benzedrine sulphate on basal metabolic rate.** J. B. LAGEN, M. H. SOLEY, and T. B. LEAKE (Proc. Soc. Exp. Biol. Med., 1936, 35, 276—278).—Administration of benzedrine sulphate (20 mg. per diem) produced a rise in basal metabolic rate which was not maintained after the final (5th) dose. Temp., pulse rate, and blood-pressure were unaffected. P. G. M.

**Role of the Kupffer cells and liver cells [of the toad] in the elimination of vital dyes.** E. DE ROBERTIS and L. S. RESTA (Compt. rend. Soc. Biol., 1937, 124, 255—256).—Basic dyes accumulate in the Kupffer cells if administered intravenously, but when they are administered by the biliary route are absorbed first by the liver cells and then pass to the Kupffer cells. They are rapidly eliminated whilst acid dyes are retained by the hepatic reticulo-endothelial system. H. G. R.

**Vital dyes in [the tissues of] the silkworm.** L. HAO (Compt. rend. Soc. Biol., 1937, 124, 524—526).—If fixed by the vacuoles the dye is not discharged; small quantities only are eliminated by the tubules of Malpighi. H. G. R.

Ictero-genic substance from *Lippia rehmanni*, Pears.—Sec A., II, 160.

Stereochemical configuration of the organic component and anti-tumour activity of metal-ascorbic acid complexes. F. ARLOING, A. MOREL, A. JOSSERAND, and L. PERROT (Compt. rend., 1936, 203, 1404—1406; cf. A., 1936, 626).— $\text{Fe}^{\text{III}}$  complexes derived from dehydroascorbic acid and the first product of oxidation of *d*-araboascorbic acid have practically the same anti-tumour action. The preponderating effect in disinfiltration is probably due to the metals associated with the redox system in the complexes. J. N. A.

Pharmacology of carotene. M. PICCININI (Boll. Chim.-Farm., 1937, 76, 29—31).—Intramuscular injection of 2 c.c. of 1% carotene (I) in oil (equiv. to 33,000 international units of vitamin-A) into rabbits increases the blood-glutathione and -cholesterol and also the erythrocyte and leucocyte counts. The significance of (I) in metabolism is discussed.

F. O. H.

Toxic effect of high doses of liver oils and activity of yeast in prevention of toxicity. M. YOSIDA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 120—147).—On diets containing 15% of cod-liver oil or liver oil from *Squalus wakiyae*, the growth of rats was greatly retarded, but administration of yeast prevented the injurious effect. Toxicity is due mainly to very unsaturated acids, and the active protecting factor in yeast is a flavin. J. N. A.

Response to drugs of gut muscle in asphyxia and in iodoacetic acid poisoning. B. N. PRASAD (J. Physiol., 1936, 86, 425—430).—The muscle under  $\text{N}_2$  or  $\text{NaCN}$  asphyxia or poisoned by  $\text{CH}_2\text{I}-\text{CO}_2\text{H}$  responds to acetylcholine, but is inhibited by adrenaline. R. N. C.

Pharmacological action of choline derivatives. DE WISPELAERE (Compt. rend. Soc. Biol., 1937, 124, 276—279).—Acetyl- $\beta$ -methyl- (I), Et ester of  $\beta$ -methyl- (II), and ethyl-choline (III) have 5, 2, and 10 times, respectively, the hypotensive action of acetylcholine and the action is more prolonged. The action of (II) or (III) is suppressed or reversed by atropine whilst that of small doses of (I) is suppressed. H. G. R.

Acetylcholine content of the cerebrospinal fluid of dogs. W. FELDBERG and H. SCHRIEVER (J. Physiol., 1936, 86, 277—284).—Eserine (I) induces the temporary appearance of acetylcholine (II) in the cerebrospinal fluid of dogs; the concn.  $\propto$  the amount of (I) injected. Slow intravenous infusion of adrenaline and asphyxia cause (II) formation or an increase of its concn., but only after administration of (I). Central vagal stimulation does not increase (II). R. N. C.

Antagonism between curarine and acetylcholine. G. BRISCOE (J. Physiol., 1936, 87, 425—428). R. N. C.

Reactions of the normal mammalian muscle to acetylcholine and eserine. G. L. BROWN, H. H. DALE, and W. FELDBERG (J. Physiol., 1936, 87, 394—424). R. N. C.

Intensification of the adrenaline-secretory action of acetylcholine by eserine. H. HERMANN, J. JOURDAN, G. MORIN, and J. VIAL (Compt. rend. Soc. Biol., 1937, 124, 317—318). H. G. R.

Influence of eserine on the secretion of adrenaline caused by stimulation of the splanchnic nerve and by intravenous injection of acetylcholine. A. TOURNADE and M. CHEVILLON (Compt. rend. Soc. Biol., 1937, 124, 565—566).—In both cases, previous injection of eserine augments the secretion of adrenaline. H. G. R.

Eserine and secretion of adrenaline. H. HERMANN (Compt. rend. Soc. Biol., 1937, 124, 617—618).—Eserine augments the secretion of adrenaline in the dog caused by acetylcholine or stimulation of the splanchnic nerve. H. G. R.

Effect of vegetative nerve poisons on intermediate carbohydrate metabolism of the liver. I. Sympathetic poisons. II. Parasympathetic poisons. T. SATO (Tôhoku J. Exp. Med., 1935, 26, 194—227, 228—267).—I. Adrenaline, unlike ergotamine, affects the intermediate carbohydrate metabolism of the liver quantitatively but not qualitatively.

II. The action of atropine is qualitatively independent of the dose but those of choline, acetylcholine, and pilocarpine vary with the amounts injected. CH. ABS. (p)

Effect of regular injections of acetylcholine on the choline-esterase activity of serum. G. E. HALL and G. H. ETINGER (J. Pharm. Exp. Ther., 1937, 59, 29—33).—The choline-esterase activity of dog serum is remarkably const. both hourly and daily over long periods of time and is unaffected by regular daily administration of acetylcholine for many months. P. W. C.

Protective action of phenolic ethers in histamine poisoning. D. BOVET and A. M. STAUB (Compt. rend. Soc. Biol., 1937, 124, 547—549).—Substances of the type 933F are antagonistic to histamine although their pharmacological actions are similar. H. G. R.

Inhibition of the effect of histamine on the isolated intestine of guinea-pigs by sympathomimetic and sympatholytic substances. G. UNGAR, J. L. PARROT, and D. BOVET (Compt. rend. Soc. Biol., 1937, 124, 445—446).—The effect of  $1 \times 10^{-6}$  g. of histamine is completely inhibited by concns. of  $10^{-6}$ — $10^{-5}$  of adrenaline,  $10^{-3}$  of ephedrine, or  $10^{-5}$  of 2-piperidinomethylbenzodioxan (which is most sp.). Yohimbine only partly inhibits the effect at  $10^{-3}$  but completely inhibits that of acetylcholine at  $10^{-4}$ . H. G. R.

Effects on blood pressure of substances contained in liver extracts. W. S. KOOPS, E. DINGEMANSE, and D. LUWISCH (Acta Brev. Physiol., 1935, 5, 70—76; Chem. Zentr., 1936, i, 1904—1905).—Depressor substances include choline and derivatives, histamine, and adenosine derivatives. Tyramine has a pressor action. A. G. P.

Action of callicrein on the isolated intestine. A new substance causing intestinal contraction. E. WERLE [with W. GOTZE and A. KEPPLER] (Biochem.

Z., 1937, 289, 217—233).—Examination of the reversible inactivation of callicrein (I) by addition of serum or extracts of lymphatic glands and of inactivation by heat, ultra-violet light, or treatment with NaOH, HCl, or  $H_2O_2$  leads to the view that the (I) factor active on circulation is identical with that causing intestinal contraction. (I) is not inactivated by serum which has been heated at  $57^\circ$  for 1 hr. If (I) is mixed with serum and immediately placed in the suspension fluid of a dog's intestine, contraction occurs due to the formation of a new factor. The amount of this factor increases during the first 2—3 min. after mixing and may disappear after 8—10 min. (I) acts in the formation of this new factor from a precursor. The factor is not to be identified with tyramine, histamine, vesiglandin, vasopressin, oxytocin, adenylic acid, or (I).

P. W. C.

**Anti-toxic and anti-allergic organic preparation (Torantil) from intestinal mucous membrane.** R. RIGLER (Munch. med. Woch., 1936, 83, 15—17; Chem. Zentr., 1936, i, 2138).—The prep. and physiological action are described. H. N. R.

**Anti-histamine action in the organism by Torantil.** W. ERCKLENTZ and B. W. ERCKLENTZ (Munch. med. Woch., 1936, 83, 17—19; Chem. Zentr., 1936, i, 2138; cf. preceding abstract).—Applications are described. H. N. R.

**Effect of general anaesthesia on the hydrogen-ion concentration and alkali reserve of the blood.** B. KANETA (Tôhoku J. Exp. Med., 1935, 26, 365—380).—General anaesthesia ( $CHCl_3$ ,  $Et_2O$ ) is followed by a decrease in blood- $p_H$  and alkali reserve. Local anaesthesia produces variable effects.

CH. ABS. (p)

**Anaesthesia and liver damage. I. Protective action of oxygen against the necrotising effect of certain anaesthetics on the liver.** S. GOLDSCHMIDT, I. S. RAVDIN, and B. LUCKE (J. Pharm. Exp. Ther., 1937, 59, 1—14).—The necrotising effect of  $CHCl_3$  and divinyl ether on dog's liver cells is largely prevented by volatilising the anaesthetic with  $O_2$ .  $Et_2O$  anaesthesia may also produce severe liver cell degeneration aggravated by  $O_2$  deficiency and poor nutritive condition.

P. W. C.

**Effects of  $p_H$  on water absorption and elimination of frogs during ether anaesthesia.** H. W. NEILD (Anaesthesia and Analgesia, 1935, 14, 169—171).—Lowering the  $p_H$  of liquid surrounding frogs diminished the period of  $Et_2O$ -anaesthesia, the amount of  $H_2O$  absorbed, and the toxic action of the anaesthetic. Increased  $p_H$  produced the reverse effects.

CH. ABS. (p)

**Nembutal anaesthesia.** M. C. HRUBETZ, S. N. BLACKBERG, and L. B. DOTTI (Proc. Soc. Exp. Biol. Med., 1936, 35, 303—305).—No correlation exists between blood-sugar level and susceptibility to nembutal, although anaesthesia is prolonged in starved animals and carbohydrate mobilisation appears to be affected.

P. G. M.

**Effect of thyroid feeding on nembutal poisoning.** E. M. SCARBOROUGH (J. Physiol., 1936, 86, 183—189).

R. N. C.

**Pentothal-sodium anaesthesia.** O. J. MURPHY (Brit. Med. J., 1936, No. 3964, 1308—1309).—Dose for dose pentothal produces a deeper anaesthesia with more pronounced depression of respiration than does evipan but recovery is more rapid than from any other barbiturate.

A. G. P.

**Evipal in prolonged anaesthesia.** A. H. MOLONEY and R. HERTZ (J. Lab. Clin. Med., 1935, 20, 1260—1265).—Experiments with various dosages in dogs and rabbits are recorded. Administration of picrotoxin prior to the anaesthetic widened the margin of safety.

CH. ABS. (p)

**Effect of narcotics on the state of living matter. Infra-red effect in narcosis of striated muscle.** P. J. JURIŠIĆ (Protoplasma, 1935, 24, 268—280).—Model experiments on colloids show that changes in state of dispersion and coagulation increase the infra-red effect. Since narcosis of frog's sartorius produced no increase in the infra-red effect, it is concluded that the solidification of living tissues in narcosis is not due to coagulation but probably to structural changes depending on the thixotropic nature of the protoplasm.

M. A. B.

**Caffeine-sodium benzoate, sodium isoamyl-ethylbarbiturate, sodium bromide, and chloral hydrate effect on the highest integrative functions.** H. G. WOLFF and W. H. GANTT (Arch. Neurol. Psychiat., 1935, 33, 1030—1057).—Treatment of dogs with caffeine- $NaOBz$  produced a strong salivary response and induced relatively stronger responses to subsequent treatments. The other drugs had the reverse effect.

CH. ABS. (p)

**Pharmacodynamic reactions of intracisternal sodium ethylisoamylbarbiturate (sodium amytal), pyridine-3-carboxylic acid diethylamide (coramine), pentamethylenetetrazole (metrazol), and picrotoxin during morphine-sodium ethylisoamylbarbiturate anaesthesia.** J. C. RICE and R. M. ISENBERGER (J. Pharm. Exp. Ther., 1937, 59, 43—47).—Intracisternal picrotoxin (0.023—1.2 mg. per kg. body-wt.) shortens the duration of respiratory paralysis produced in dogs by intracisternal Na amytal (5.3—11.3 mg. per kg.). Intracisternal coramine (18.3—28 mg. per kg.) and metrazol (0.9—8.1 mg. per kg.) fail to hasten the return of spontaneous respiration after Na amytal (6.3 mg. and 2.3—6.4 mg. per kg., respectively).

P. W. C.

**Barbiturates in cerebrospinal fluid.** F. L. KOZELKA and H. J. TATUM (J. Pharm. Exp. Ther., 1937, 59, 63—67).—Under the conditions employed, only minute amounts of barbiturates (I) were detected in spinal fluid; the depressant effect was dependent on the concn. of (I) in the fluid. Analysis of the fluid does not give significant evidence in respect of the character or amounts of the drug absorbed.

P. W. C.

**Alkyl N-8-quinolylcarbamates as local anaesthetics.**—See A., 1936, 1389.

**Chemotherapy. II. Diffusibility of aromatic arsenicals into erythrocytes: action of the latter on quinquevalent arsenicals.** E. M. LOURIE, F. MURGATROYD, and W. YORKE (Ann. Trop. Med.,

1935, 29, 265—282).—Reduced tryparsamide (I) diffuses rapidly into red blood cells suspended in Ringer-glucose at 37°. In nutrient media dil. solutions of reduced (I) lose trypanocidal activity, possibly through combination with protein to form an inert substance. With quinquevalent (I) the substance diffusing out of red cells after exposure to the compound showed markedly greater trypanocidal power. This activation was shown by a solution of laked red cells, although hæmoglobin did not show this change either in the reduced or oxidised form.

CH. ABS. (p)

Comparative chemotherapeutic studies of Arsenoxide (3-amino-4-hydroxyphenylarsenoxide) and neoarsphenamine. G. W. RAIZISS and M. SEVERAC (Amer. J. Syphilis Neurol., 1935, 19, 473—480).—The max. tolerance and therapeutic indices of the compounds for rats and rabbits are determined.

CH. ABS. (p)

Arsphenamine hypersensitiveness in guinea-pigs. III. (A) Regional geographic variability in susceptibility. (B) Chemical specificity of hypersensitivity. (C) Variation in sensitising proclivities of different brands. M. B. SULZBERGER and F. A. SIMON (J. Allergy, 1934, 6, 39—55).—Hypersensitivity to neoarsphenamine is sp. to the arsenobenzene complex and is not identical with hypersensitivity to elemental As.

CH. ABS. (p)

Comparative efficiency of mercurial diuretics with and without theophylline (mercuropurin, salyrgan, etc.). M. N. FULTON and A. H. BRYAN (J. Lab. Clin. Med., 1935, 20, 1252—1260).—Neither mercuropurin [an org. Hg-theophylline (I) compound containing free I] nor a mercurial diuretic mixed with (I) was superior to salyrgan (II) in increasing urinary output in man, but both were more active than (II) in the case of dogs and rabbits.

CH. ABS. (p)

Comparative effect of santonin, isoartemisin, and santoninamine on the blood-sugar of rabbits. W. E. EVANS, jun. (Quart. J. Pharm., 1936, 9, 641—646).—Orally administered isoartemisin (I) has no effect on the fasting blood-sugar or on alimentary hyperglycæmia. Santoninamine sulphate (II) (0.5 g. per kg.) lowers the blood-sugar 3—5 days after subcutaneous injection. The toxic effect (hepatic and nephritic degeneration) of (I) is > that of (II).

F. O. H.

Biological action of iodoprotein-bromo-compounds on the metamorphosis of the axolotl. W. BRANDT (Biochem. Z., 1937, 289, 276—278).—“Jobramag” (an iodo-bromo-protein prep.) fed along with thyroid powder did not cause an acceleration of metamorphosis.

P. W. C.

Pharmacognosy of *Trixis divaricata*, Spreng, var. *discolor* Griseb. L. FLORIANI (Rev. farm. Buenos Aires, 1935, 77, 223—226).—The drug contains resins, saponins, and an alkaloid.

CH. ABS. (p)

Doebner reaction.—See A., 1936, 1393.

*Daphnia* as a biological reagent. A. VIEHOEVER (J. Amer. Pharm. Assoc., 1936, 25, 1112—1117).—The use of *D. magna* for the study and assay of physiologically active substances is described.

F. O. H.

Pharmacology of smooth muscle. Luminal-papaverine. M. A. MANCINI (Boll. Soc. ital. Biol. sperim., 1935, 10, 966—967; Chem. Zentr., 1936, i, 2387).—The depressor action of luminal-papaverine is unaffected by Br and does not affect the normal action of pilocarpine on blood pressure.

A. G. P.

Action of adrenaline and atropine on blood-alcohol. S. MINZ and E. SERIANNI (Atti R. Accad. Lincei, 1936, [vi], 24, 235—238).—Of six persons who had ingested aq. EtOH, only two showed an increase and decrease, respectively, in blood-EtOH on administration of atropine or adrenaline (cf. Serianni, A., 1935, 1285).

F. O. H.

Influence of drugs which act on the autonomic nervous system on sulphur metabolism. Y. SAITO (Sei-i-Kwai Med. J., 1935, 54, No. 2, 104—114).—Adrenaline and atropine accelerated, and eserine, nicotine, and pilocarpine diminished, S metabolism in male rabbits.

CH. ABS. (p)

Effect of drugs which act on the autonomic nervous system on the inorganic salt contents of the urine and blood of rabbits. H. KANEKO (Sei-i-Kwai Med. J., 1935, 54, No. 4, 125—155).—Effects of atropine, ergotoxin, eserine, and pilocarpine on the Ca, Mg, K, and Cl contents of blood and urine of normal and splenectomised rabbits are recorded. All drugs influence salt metabolism, blood cells, and hæmoglobin content.

CH. ABS. (p)

Action of the hydrochloride and phenylpropionate of morphine on the excitability of the motor nerves in a medium deprived of electrolytes. Comparison with the action of the hydrochloride in Ringer's solution. J. RÉGNIER and A. QUEVAUVILLER (Compt. rend. Soc. Biol., 1937, 124, 623—626).—The action of the phenylpropionate (I) on the motor nerve is 20—30 times that of the hydrochloride (II). In the absence of electrolytes, the effect of (II) depends on, whilst that of (I) is independent of, the concn.

H. G. R.

Changes in potassium and the sympathetic-adrenaline-hepatic mechanism following pathological or pharmacological conditions. B. A. HOUSSAY, A. D. MARENZI, and R. GERSCHMAN (Compt. rend. Soc. Biol., 1937, 124, 384—386).—Blood-K is increased by actions directly on the adrenal medulla (nicotine) or on the central (asphyxia) or peripheral nervous system (vasopressin).

H. G. R.

Effect of salivary activity on the composition of bovine blood. J. H. BLACKWOOD and G. M. WISHART (J. Physiol., 1936, 86, 37—45).—Pilocarpine in cows causes rapid but transient rises in blood-Fe, lipin- and org. acid-sol. P, and a similar fall in inorg. P, which is apparently selectively absorbed by the salivary gland. The changes are contemporaneous with the increased flow of saliva. The changes in P in jugular venous blood are > in mammary venous blood, but the Fe increases are of the same order in both veins.

R. N. C.

Influence of quinine hydrochloride on iodine contents of endocrine organs and blood of thyroidectomised rabbits. A. OTA (Sei-i-Kwai

Med. J., 1934, 53, No. 12, 24—30).—Quinine hydrochloride does not affect the I contents of endocrine organs or blood of thyroidectomised rabbits as it does in normal animals. CH. ABS. (p)

**Chemotherapeutic action of homologues of apoquinine.** E. LIEBETRUTH (Z. Immunitats., 1935, 84, 445—454; Chem. Zentr., 1936, i, 2587).—*n*-Propyl-, *n*-butyl- (I) *n*-hexyl-, and *n*-octyl-apoquinine (II) were strongly bactericidal towards *Pneumococcus in vitro*. The bacteriostatic action of (I) and (II) was relatively weaker. In their effects on infected mice all derivatives were inferior to ethylapoquinine. A. G. P.

**Pharmacological action of four *Corydalis* alkaloids.** K. K. CHEN, R. C. ANDERSON, and T. Q. CHOU (Chinese J. Physiol., 1937, 11, 7—12; cf. A., 1934, 1014).—The min. lethal doses of the hydrochlorides of *corydalis B, J, L*, and *M*, determined by intravenous injection in mice, are 103, 42, 150, and 41 mg. per kg. respectively. Sublethal doses of *B* and *L* produce catalepsy in mice and monkeys, *J* and *M* cause convulsions in mice. Otherwise *B, J, L*, and *M* are very similar in physiological action. E. M. W.

**Pharmacological action of tetrandrine, an alkaloid of Han-fang-chi.** K. K. CHEN, A. L. CHEN, R. C. ANDERSON, and C. L. ROSE (Chinese J. Physiol., 1937, 11, 13—24).—Various physiological effects are described. The min. lethal doses of tetrandrine hydrochloride for mice, rats, guinea-pigs, rabbits, pigeons, and monkeys are respectively 55, 55, 21, 17, 125, and 30—40 mg. per kg. E. M. W.

**[Pharmacological] action and toxicity of menisine and menisidine.** K. K. CHEN and T. Q. CHOU (Chinese J. Physiol., 1937, 11, 29—34; cf. A., 1935, 1433).—Min. lethal doses of menisine (I) and menisidine (II) for mice, rats, and guinea-pigs are 35 and 100, 20 and 75, 45 and 60 mg. per kg., respectively. (I), (II), and tetrandrine are similar in physiological action. E. M. W.

**Effect of yohimbinyllamine.** B. YANAI (Tôhoku J. Exp. Med., 1935, 26, 164—171).—The amine is less active than the parent substance in its cardiac and circulatory effects but has no local anaesthetic or stimulatory action on the central nervous system. CH. ABS. (p)

**Alkaloids of curare.** K. B. TAYLOR (Ann. Chim. Analyt., 1937, [iii], 19, 5—11, 33—34).—A review.

**Biological determination of glucosides in *Adonis vernalis*.** F. MERCIER and S. MACARY (Compt. rend. Soc. Biol., 1937, 124, 459—463).—The min. lethal dose in dogs by intravenous injection is 0.70 and 1.75 mg. per kg. for adonidosiside and adonivernoside, respectively. H. G. R.

**Residual carbon and nitrogen of blood in acute lethal hydrocyanic acid poisoning.** T. INOUE (Biochem. Z., 1937, 289, 172—175).—In rapid acute HCN poisoning as in curarised rabbits after strangling, the blood residual C and N do not increase. Increases in these factors arise only when the animals are allowed to go into convulsions. P. W. C.

**Determination of the time of administration in arsenical poisoning.** L. VAN ITALLIE (J. Pharm. Chim., 1937, [viii], 25, 97—101).—The determination of As in portions of hair at different distances from the scalp gives an approx. date of administration of As, the hair being assumed to grow at 1.5 cm. per month. W. O. K.

**Isolation of arsenic from head hairs.** J. A. LABAT (Bull. Trav. Soc. Pharm. Bordeaux, 1935, 73, 175—179; Chem. Zentr., 1936, i, 2156).—Such a procedure may be used to diagnose As poisoning. H. N. R.

**Subacute arsenic poisoning.** L. VAN ITALLIE and A. J. STEENHAUER (Pharm. Weekblad, 1937, 74, 231—233).—The As contents of faeces, hair, nails, and skin scales in a subacute case of As poisoning are determined and discussed. S. C.

**Toxic action of metals on *Balanus*.** T. LEE (Compt. rend. Soc. Biol., 1937, 124, 665—666).—The toxicity of Cu is markedly decreased by the presence of Zn, Sn, or Pb. H. G. R.

**Parathyroid extract and viosterol treatment of radium poisoning.** L. F. CRAVER and H. SCHLUNDT (J. Amer. Med. Assoc., 1935, 105, 959—960).—Alternate periods of feeding parathyroid extracts with low-Ca diets and of viosterol with high-Ca diets did not cause marked increases in amounts of Ra excreted. CH. ABS. (p)

**Determination of soluble enzymes in official [pharmacopœal] preparations.** H. PENAU and R. AUDIC (J. Pharm. Chim., 1937, [viii], 25, 107—110).—Standard enzyme preps. kept in sealed tubes at 0° retained their activity almost unaltered for 3 years. W. O. K.

**Effect of oxygen under pressure on succinic dehydrogenase.** W. LIBBRECHT and L. MASSART (Compt. rend. Soc. Biol., 1937, 124, 299—300).—Succinic dehydrogenase is inhibited by O<sub>2</sub> under pressure, the true dehydrogenase of the system being affected. H. G. R.

**Stable lactic dehydrogenase preparation.** C. GURCHOT and A. LOWMAN (Proc. Soc. Exp. Biol. Med., 1936, 35, 315—316).—Baker's yeast is washed with saline and ground with PO<sub>4</sub>''' buffer saturated with Et<sub>2</sub>O. After centrifuging the lysate is cooled and shaken with Et<sub>2</sub>O. The Et<sub>2</sub>O-gel is removed and the filtered clear liquid is saturated with (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>; the ppt. consists of the purified enzyme and is stable when dry. P. G. M.

**Oxidation of pyruvic acid by liver enzymes.** F. CEDRANGOLO (Enzymologia, 1937, 1, 359—368).—AcCO<sub>2</sub>H is decarboxylated by liver, forming MeCHO. The latter is then oxidised (probably) to AcOH and succinic acid. The oxidative breakdown of keto-acids is inhibited by F', HCN, and by heat. In the presence of HCN the R.Q. increases, indicating that decarboxylation is less inhibited than is dehydrogenation. E. A. H. R.

**Oxidation of *l*-ascorbic acid by plant enzymes.** S. W. JOHNSON and S. S. ZILVA (Biochem. J., 1937, 31, 438—453).—Aerobic ascorbic oxidase of cabbage juice has a broad *p<sub>H</sub>* optimum, 5.0—7.0, falling

rapidly on the acid and slowly on the alkaline side. It is inhibited by 0.001*M*-NaCN, most strongly at  $p_H$  7.0. Pyrocatechol (I) is oxidised by the crude enzyme but not by that obtained by  $(NH_4)_2SO_4$  pptn. PhOH is not oxidised. With two substrates simultaneously (I) oxidation does not begin until that of ascorbic acid (II) is complete. The preps. contain peroxidase but no peroxide. Methylene-blue cannot act as acceptor. EtOH and  $COMe_2$  ppts. are inactive. Juice and ppts. from cauliflower, cucumber, and marrow differed from those from cabbage only in sensitivity to NaCN and differential activity of pptd. preps. In the apple and potato oxidation of (II) depends on an insol. PhOH oxidase and sol. intermediary phenolic substances. Activity and sensitivity to NaCN at  $p_H$  6.0 are  $>$  at the natural  $p_H$  3.0. All these systems also oxidise *d*-glucoascorbic acid.

R. M. M. O.

**Individuality of ascorbic acid oxidase.** M. SRINIVASAN (Current Sci., 1936, 5, 296—297).—The press juice from the pulp of *Cucumis sativus* (cucumber) oxidises ascorbic acid (I) by virtue of its oxidase (II) content. The juice from the rind, which contains (II) and peroxidase, but no peroxide, oxidises (I) as readily as does that from the pulp.

J. L. D.

**Simplification of the peroxidase reaction [in blood smears].** A. G. DOUGLASS (Chem.-Ztg., 1937, 61, 130).—After successive treatment with a solution of benzidine in dioxan, and aq. safranin mixed with  $H_2O_2$ , myeloid elements show brown granulations while the nuclei take up the counter-stain.

E. A. H. R.

**Comparison of catalase activity and vitality of silkworm eggs.** K. YAMAFUJI (Enzymologia, 1936, 1, 268—270).—Catalase activity and vitality can be correlated.

E. A. H. R.

**Effect of arsenic derivatives on the activity of tissue lipase and amylase.** M. A. STOLBERG (Ukrain. Biochem. J., 1936, 9, 1099—1108).—The lipase activity of the liver, kidney, and heart of white mice is reduced, and the amylase activity is increased, by injections of atoxyl or Na arsenite. Spleen lipase is unaffected, but spleen amylase is activated by arsenicals.

R. T.

**Choline-esterase in striated muscle of the cat.** A. MARNAY and D. NACHMANSON (Compt. rend. Soc. Biol., 1937, 124, 446—448).—The rate of hydrolysis of acetylcholine is approx. equiv. to that in the striated muscle of the guinea-pig.

H. G. R.

**Choline-esterase activity of normal and pathological sera.** G. E. HALL and C. C. LUCAS (J. Pharm. Exp. Ther., 1937, 59, 34—42).—A micro-modification of the continuous titration method for determining the rate of hydrolysis of acetylcholine by blood-serum is described. The choline-esterase activity is defined in terms of initial velocity of hydrolysis and the unit adopted is the amount of enzyme necessary to liberate 1 c.c. of 0.01*N*-AcOH in 10 min. at  $p_H$  8 and 37.5°. The activity in 40 normal and 162 pathological human sera varied from 0.9 to 3.9 units per c.c., about 75% of the cases being between 1.9 and 3.2. No correlation between activity of serum and age, sex, diet, heart rate, or

K (A., III.)

blood pressure could be detected. None of the clinical conditions studied produced any characteristic change in the activity of the enzyme. P. W. C.

**In vitro digestion of fats.** N. N. DASTUR and K. V. GIRI (Proc. Soc. Biol. Chem. India, 1937, 1, 40—41).—The rates of hydrolysis of various substrates by castor-seed lipase are in the decreasing order: butter fat (I) (cow and buffalo), coconut (II), sesamé (III), and ground-nut oils (IV). With pancreatic lipase ( $p_H$  12.6) (I) was the most slowly hydrolysed substrate, but at  $p_H$  9.3 it was rapidly digested. The rates of hydrolysis by (VI) of (I) and (II) but not of (III) or (IV) are markedly accelerated in presence of Na taurocholate. The kinetics of the hydrolysis of (I) and other oils have been examined.

W. O. K.

**Quantitative changes in the enzymes present in the liver and in various tissues due to impaired renal functions.** S. MURATA (Japan J. Gastroenterol., 1935, 7, 69—87).—Nephrectomy causes a slight increase in asparaginase, amylase, and lipase in the livers of rabbits.

CH. ABS. (p)

**Manometric method for enzymic determination of arginine.** A. HUNTER and J. B. PETTIGREW (Enzymologia, 1937, 1, 341—352).—Arginine (I) is hydrolysed by arginase, the urea formed is decomposed by urease, and the resulting  $CO_2$  measured manometrically. The method has been applied to the determination of (I) in protein hydrolysates and tryptic digests.

E. A. H. R.

**Mechanism of action of glyoxalase.** J. V. GIBSAVIČIUS and P. A. CHEIFETZ (Biochimia, 1936, 1, 525—541).—The velocity of enzymic conversion of AcCHO (I) into lactic acid rises with increasing concn. of free and combined (as semimercaptal) (I) to a max., depending on the glutathione (II) concn. It falls with increasing concn. of free (II); the concn. of (I) inversely  $\propto$  that of (II). Yamazoye's compound (A., 1936, 1419) is an intermediate product of the action of glyoxalase on the semimercaptal.

R. T.

**Dependence of the reaction of combination of methylglyoxal with glutathione on  $p_H$ .** J. V. GIBSAVIČIUS and P. A. CHEIFETZ (Biochimia, 1936, 1, 542—547).—The velocity of reaction of AcCHO and glutathione to yield semimercaptal rises rapidly with rising  $p_H$  from 2 to 3.5, above which it becomes immeasurably great.

R. T.

**Amino-acid deamidases of the animal body.** B. KISCH (Klin. Woch., 1936, 15, 170—171; Chem. Zentr., 1936, i, 2375).—3—4 different types of deamidases are recognised.

H. N. R.

**Enzyme for decomposition of creatinine and its action on the "apparent creatinine" of blood.** B. F. MILLER and R. DUBOS (Proc. Soc. Exp. Biol. Med., 1936, 35, 335—336).—A strain of soil bacteria (*NC*) grew in a creatinine-inorg. salt medium, but the enzyme was not liberated from the cells; it was, however, obtained in aq. solution by disruption of the cells of another species (*HR*). The enzyme decomposes 50% of the Jaffe-reactive material in human red cells and  $>50\%$  in the plasma.

P. G. M.

**Effect of acid and basic diets on the cathepsin content of organs.** M. F. GULI and M. A. KOLOMEITSCHENKO (Ukrain. Biochem. J., 1936, 9, 1085—1098).—The cathepsin content of glycerol extracts of kidney or liver is not significantly affected by previous feeding of the rabbits with acid, basic, or neutral diets. R. T.

**Chemistry of cell growth and division.** C. VOEGTLIN (Cold Spring Harbor Symp., 1934, 2, 84—88).—The hydrolysis of proteins by cathepsin is activated by reduced glutathione,  $p_H$  being a controlling factor. Small amounts of Cu inhibit protein synthesis. The toxic action of As, Au, and Cu compounds and CN' is inhibited by glutathione (I). Growth rates of amoebæ are directly correlated with their (I) content. The relative effects of Cu and (I) vary with the age of the cells.  $H_2O_2$ , methylene-blue, Cu salts,  $CH_3I \cdot CO \cdot NH_2$ , and high [CO] do not influence mitosis. Anaesthetics decrease  $O_2$  consumption and inhibit mitosis. Protein synthesis is controlled by  $O_2$  tension. (Cf. A., 1936, 1569.) CH. ABS. (p)

**Proteinases (cathepsin) in tissues of the chicken embryo.** B. GOLDSTEIN and M. GINZBURG (Enzymologia, 1937, 1, 369—372).—Glycerol extracts from the yolk sac, yolk, and germinal membranes have no proteolytic effect on gelatin during the first days of development. A proteolytic effect, after activation with  $H_2S$ , appears on about the 6th day, and one without activation on the 10th.  $H_2S$  activation is considerable until the last days of incubation, when it changes to a depression. The chemical properties and physiological function of the cathepsin in the egg and in mammalian placenta are probably identical. E. A. H. R.

**Proteolytic enzymes of monocytic and polymorphonuclear pleural exudates.** C. WEISS and E. J. CZARNETZKY (Arch. Path., 1935, 20, 233—244).—Rabbit monocytes contain only one proteinase, pepsin. Cathepsin, trypsin, and pepsin are present in polymorphonuclears. Serous portions of exudates of monocytic types inhibit, and those of polymorphonuclear types enhance, peptic digestion. Fluid of polymorphonuclear exudates inhibits the tryptic activity of the corresponding cells, whereas cells of monocytic exudates inhibit the tryptic activity of their fluid. Antagonistic extractable and bound enzymes occur in monocytic and polymorphonuclear cells of inflammatory exudates. In the digestion of gelatin by supernatant fluid of either type of exudate and in that of leucylglycine by monocytic fluid there is a decrease in the no. of  $CO_2H$  groups. CH. ABS. (p)

**Inactivation of pepsin by iodine and isolation of di-iodotyrosine from iodinated pepsin.** R. M. HERRIOTT (J. Gen. Physiol., 1937, 20, 335—352).—I-inactivation of pepsin (I) involves formation of di-iodotyrosine (II). The influence of  $p_H$  on the rate of iodination is analogous to that on iodination of glycyltyrosine. Computation from titration curve of the tyrosine content of (I) gives vals. agreeing with the current estimate. 53% of the I absorbed by (I) was recovered as (II) from hydrolysate in an incomplete crystallisation. Inactivation is progressive with increasing iodination, becoming complete with

35—40 atoms of I per mol. of (I). No appreciable oxidation occurs. R. M. M. O.

**Influence of intense mechanical vibration on proteolytic activity of pepsin.** L. A. CHAMBERS (J. Biol. Chem., 1937, 117, 639—649).—Cryst. pepsin in acid solution ( $p_H$  1.8) is inactivated by exposure to sound waves of 9000 cycles according to  $A = A_0 e^{-kt}$ , where  $A$  is the activity remaining at time  $t$  and  $A_0$  is the initial activity. Inactivation does not take place in absence of  $O_2$ , and in some unpurified preps. the activity is increased. P. G. M.

**Parallel concentration of enzymes in pancreatic juice.** S. G. BAXTER (Amer. J. Digest. Dis. Nutrition, 1935, 2, 108—111).—In the pancreatic juice of rabbits variations in concn. of trypsin, amylase, and lipase were of a parallel nature.

CH. ABS. (p)

**Action of the trypsin-enzyme complex on substituted proteins.** A. R. KIESEL and D. P. ROGANOVA (Biochimia, 1936, 1, 1—20).—The action of trypsin-proteinase (I) on edestin (II) is unaffected by Et esterification of the free  $\cdot CO_2H$ , sulphonation, or deamination. The Bz derivatives of (II) or deaminated (II) are not attacked by (I); the debenzoylated products undergo proteolysis normally. It is concluded that the presence of  $\cdot NH_2$  or  $\cdot OH$ , or of the latter alone, is essential for the action of (I).

R. T.

**Does trypsin inactivate urease?** J. B. SUMNER and A. L. DOUNCE (J. Biol. Chem., 1937, 117, 713—717).—The view that urease (I) is rapidly inactivated in presence of gum arabic by trypsin (II) is erroneous. (I) preserved with  $SO_3''$  was not measurably inactivated by (II) at room temp. over a period of 95 hr. P. W. C.

**Enzymic properties of natural papain.** M. FRANKEL, R. MAJMIN, and B. SHAPIRO (Nature, 1937, 139, 249).—Latex of *Carica papaya* at different stages of development and size splits both gelatin (I) and Witte's peptone (II) and need not be previously activated by HCN. The degree of hydrolysis of (I) is < that of (II). On keeping, the activity of the latex towards (I) increases and diminishes towards (II). Preps. obtained from natural latex by different methods show different qual. and quant. enzymic properties, e.g., a thermostable, natural activator inducing peptone cleavage and a prep. showing the enzymic features generally attributed to papain have been isolated. Contrary to the lit., true ovalbumin is split directly by a latex prep. Activation (or inhibition) by latex bodies of protein cleavage or peptone cleavage, respectively, appear to be different processes. L. S. T.

**Phytases of wheat flour.** E. V. KOLOBKOVA (Biochimia, 1936, 1, 512—524).—Wheat phytase is inactive at  $>75^\circ$ , and at  $p_H < 3$  or  $> 7.3$ ; the optimum temp. and  $p_H$  are  $55^\circ$  and 5.5. The temp. coeff. of reaction and the Arrhenius const. fall with increasing temp., and are least at  $p_H$  5.5.  $>55^\circ$  of the total P of wheat grain is present as phytin, the content of which falls, with corresponding increase in lecithin- and protein-P, on germination. The  $p_H$  and temp. ranges of impure phytase are wider

than those of purified enzyme. The velocity of reaction falls with increasing relative concn. of substrate. R. T.

**Proteolytic enzymes of the soya bean.** E. D. STACHEEVA-KAVERZNEVA and E. J. OLEINIKOVA (Biochimia, 1936, 1, 321—330).—Extracts of resting and germinating soya beans are equally active in reducing  $\eta$  of aq. gelatin, but whilst the extracts from the resting seeds show little or no proteolytic activity, those from the germinating seeds are much more active. During germination, the proteases of the seeds remain relatively const., but the peptidases increase. With peptone as substrate, the activity of the protease is optimum at  $p_H$  7.0, and with gelatin and collagen (I) at 7.2—7.4. The small activity at acid  $p_H$ , and the absence of any activating action by KCN and  $Na_2S$ , indicate a low content of cathepsin (separated by adsorption on kaolin). Notwithstanding the specificity of plant proteases, the proteolytic enzymes of the germinating beans rapidly dissolve powdered (I). W. O. K.

**Proteolytic enzymes of common moulds.** J. BERGER, M. J. JOHNSON, and W. H. PETERSON (J. Biol. Chem., 1937, 117, 429—438).—The kinetics of the proteolytic enzymes in species of *Penicillium* and *Aspergillus* were studied. Proteinase (gelatin; optimum  $p_H$  7.0), carboxypolypeptidase (chloroacetyl-*L*-tyrosine), aminopolypeptidase (*DL*-leucyl-diglycine), and dipeptidase (*DL*-leucylglycine) were present in all species in varying amounts and many contained smaller amounts of other peptidases (diglycine, triglycine). Total and relative enzyme contents vary independently of species relationships and depend on the medium. R. M. M. O.

**Fission of animal proteins by the proteases of *Aspergillus oryzae*.** E. D. STACHEEVA-KAVERZNEVA and E. J. OLEINIKOVA (Biochimia, 1936, 1, 331—342).—Extracts made from *A. oryzae*, grown on a medium prepared from defatted soya-bean meal, hydrolysed gelatin and collagen (optimum  $p_H$  7.2) but not elastin and keratin. Addition of 0.1% of  $Na_2SO_4$  or  $(NH_4)_2SO_4$  slightly increased the activity whilst greater concns. were inhibitory. By pptn. with EtOH, preps. were obtained almost equal in activity to pancreatin from ox pancreas. W. O. K.

**Action of vegetable disaggregating and proteolytic enzymes on the proteins of wheat and rye.** M. P. JURGENSON (Biochimia, 1936, 1, 374—385).—The action of the natural mixture of proteolytic enzymes of wheat-flour extracts on the proteins of wheat gluten is max. at  $p_H$  3.7—4.7 for leucosin (I), 3.7 for gliadin (II), and 4.9—5.3 for glutenin (III). For the mixed proteolytic enzymes of yeast extract the optimum  $p_H$  ranges are 3.7—4.7, 3.7, and 4.9—5.3, respectively. The fission of (III) is < that of (I) or (II). The optimum  $p_H$  for the action of wheat-flour protease on (II) or (III) is 4.9—5.0, whilst yeast protease has optimum activity on (II) or (III) at  $p_H$  3.3—4.9. The action of both proteases is accompanied by little change in  $NH_2-N$ , so that their actions are disaggregating rather than proteolytic. The optimum  $p_H$  for the action of the natural mixture of proteolytic enzymes of rye-flour extracts

on the proteins of rye flour are: (II) 3.7, (3.4—3.7); globulin 3.7 (3.7—4.2); (III) 4.9—5.6 (4.4—4.95), figures in parentheses being the isoelectric zones. W. O. K.

**Cleavage of peptide rings by proteinases.** K. SHIBATA and Y. TAZAWA (Proc. Imp. Acad. Tokyo, 1936, 12, 340—345).—Failure to observe the cleavage of diketopiperazines (I) by proteinases is due to the low affinity of these enzymes for artificial substrates of low mol. wt. Data are given for the hydrolysis of glycyl-*D*-glutamic anhydride by trypsin and papain, and of *DL*-diaminopropionic anhydride dihydrochloride by pepsin. The hydrolyses of both proteins and (I) have the same  $p_H$  optima. The prep. of *L*-histidine anhydride dihydrochloride, decomp. 270—280°,  $[\alpha]^{25} + 48.1^\circ$ , is described. E. A. H. R.

**Anhydrolytic decomposition of edestin and enzymic cleavage of the decomposition products.** A. FODOR and N. LICHTENSTEIN (Enzymologia, 1936, 1, 311—320).—The decomp. of edestin by heating with anhyd. glycerol gives a product separable into four fractions according to their solubilities in  $H_2O$ , aq. EtOH, and AcOH. These substances have a closed polypeptide ring structure. Compositions, based on the  $NH_2$ -acids found in the total hydrolysate, are suggested, and the mol. wts. of 1300 and 2600 thus indicated are confirmed cryoscopically. All four fractions are hydrolysed by pepsin (I) and pancreatin (II), and by papain without previous activation. (II) but not (I) yields a product which is further attacked by arginase. E. A. H. R.

**Rôle of maltase in the hydrolysis of starch by different varieties of malt.** D. I. LISSITZIN (Biochimia, 1936, 1, 351—358).—The seeds of maize, sorghum, and millet, and the malts prepared from them, contain a maltase active at  $p_H$  4.5—5.0. Although barley malt exerts no action on maltose, the presence of maltase is not excluded, for in this malt substances are present which inhibit maltase. W. O. K.

**Ratio of synthetic to hydrolytic action of invertase as a characteristic value for different varieties of onions.** B. A. RUBIN (Biochimia, 1936, 1, 467—478).—The ratio sucrose/monoses varies from 0.1 to 21.3 for different varieties of onion. The higher vals. are obtained for biennial plants, showing that slow growth is associated with preponderatingly synthetic action of invertase. The sucrose content of the bulb is greatest, and of the leaves least, at maturity. Analogous variations are found for different varieties of beet and marrow. R. T.

**Application of the vacuum-infiltration method to the measurement of the synthetic and hydrolytic activity of invertase in living plant tissue.** A. L. KURSANOV (Biochimia, 1936, 1, 269—294).—The hydrolytic and synthetic activities of the invertase in leaves of various plants are measured by injecting solutions of sucrose or of glucose and fructose and observing the changes which ensue. The relative vals. of the activities differ in different plants. When the concn. in the leaf of sucrose or of invert-sugar is changed by infiltration, the activity

of the invertase alters in such a way as to restore the disturbed equilibrium. W. O. K.

Optimal  $p_H$  of the invertase of different strains of *Aspergillus niger*. V. A. KIRSANOVA (Biochimia, 1936, 1, 386—389).—For the invertases obtained from all strains of *A. niger* investigated, whether producing citric acid or not, the optimum  $p_H$  was 2.5—4.0. W. O. K.

Reversibility of the action of lactase. D. M. MICHLIN and O. J. BORODINA (Biochimia, 1936, 1, 147—156).—Aq., COME<sub>2</sub>, and glycerol extracts of mammary gland promote synthesis of lactose from glucose and galactose. Attainment of equilibrium between the components is much more rapid with the extracts than with tissue pulp. R. T.

Amylase system of rice grain during ripening and germination. K. V. GIRI and A. SREENIVASAN (Biochem. Z., 1937, 289, 155—166).—Experimental details of work already summarised (A., 1936, 1418). P. W. C.

The glycogenolytic system in liver and influence on it of insulin and adrenaline. R. WILLSTATTER and M. ROHDEWALD (Enzymologia, 1936, 1, 213—255).—Amylase occurs in liver in both activated and inhibited states. Insulin and adrenaline annul both activating and inhibiting effects. E. A. H. R.

Heredity in amylase activity. K. YAMAFUJI and S. GOTO (Enzymologia, 1936, 1, 271—272).—The blood-amylase content of silkworms approximates to the mean val. of that of the parents. E. A. H. R.

Amylase content of pure line barley. K. MYRBACK (Enzymologia, 1936, 1, 280—287).—The total and free active amylase (I) contents of pure line barleys were determined over a period of 7 years. The relation between free and total (I) content is a characteristic of each species. Different species of barley have very different (I) contents, which are not paralleled by protein contents. Differences in (I) content persist in green and kiln-dried malt. E. A. H. R.

Glycolysis of various substrates by extracts of sarcoma and muscle. F. H. SCHARLES, M. D. BAKER, and W. T. SALTER (Amer. J. Cancer, 1935, 25, 122—129).—Extracts of mouse sarcoma produced lactic acid from hexose phosphates. Glycogen, glucose, and fructose were not utilised. Extracts of sarcoma differed from those of muscle in being unable to form phosphate esters from small saccharide mols. even in the presence of adenosine triphosphate. CH. ABS. (p)

Cozymase as hydrogen-carrying co-enzyme in muscle-glycolysis. H. VON EULER, E. ADLER, G. GUNTHER, and H. HELLSTRÖM (Z. physiol. Chem., 1937, 245, 217—245).—Purest cozymase (I) and dihydrocozymase (II) cannot replace adenylic acid (III) in glycolysis but the material obtained by heating (I) with 0.01—0.04*N*-NaOH at 100° for 5 min. replaces (III) as PO<sub>4</sub>''' carrier and in glycolysis. The material obtained from (II) by inactivation with acid is not a PO<sub>4</sub>''' carrier. During the dehydrogenation of lactic acid (IV) by the dehydrogenase of heart and muscle (I) is reversibly converted into (II), but since

the position of equilibrium favours (IV) production, AcCO<sub>2</sub>H (V) is reduced to (IV) in presence of apodehydrogenase. The mechanism of the reduction is analogous to that of MeCHO by the EtOH dehydrogenase of yeast. Similarly, in the reversible conversion by (I) of glyceraldehydophosphoric acid (VI) into glycerophosphoric acid (VII), (VII) production is favoured. Spectroscopic observation shows that (I) transfers H from (VII) to (V). The amounts of (IV) produced in dialysed muscle extracts by the systems hexosediphosphoric acid-(V), (VI)-(V), and (VII)-(V) indicate that these systems are activated by (I). The co-enzyme system of glycolysis includes (I) as H carrier. W. McC.

Coupling of the synthesis of adenosinetriphosphoric acid with the main oxidation-reduction process in blood glycolysis. Z. DISCHE (Enzymologia, 1936, 1, 288—310).—Two types of glycolysis are distinguished, the normal, requiring adenosinetriphosphoric acid (I) and accounting for most of the glucose breakdown in the cell, and a secondary glycolysis which occurs only after partial decomp. of (I). This secondary glycolysis is due to a coupling of the oxidation-reduction process between AcCO<sub>2</sub>H and triose phosphates and the resynthesis of (I) from adenylic acid and inorg. P. The decomp. of (I) by adenylypyrophosphatase accelerates glycolysis by promoting the Parnas reaction (A., 1934, 1027). An explanation is given of the regulation of glycolysis by the co-operation of the spontaneous decomp. of (I) and of its resynthesis. E. A. H. R.

Competition between phosphorylating enzymes in muscle extract. H. LEHMANN and D. M. NEEDHAM (Biochem. J., 1937, 31, 329—338).—From a mixture of adenylic acid and phosphopyruvic acid creatine accepts PO<sub>4</sub>''' more rapidly than glycogen although the PO<sub>4</sub>''' is gradually transferred to the glycogen as its phosphorylation is irreversible. The action is the same at  $p_H$  8.8 and 6.5. Either acceptor is readily phosphorylated alone. At  $p_H$  8.8 adenylic acid accepts from phosphopyruvic acid much more rapidly than from creatine phosphate, which reacts more quickly at  $p_H$  6.5. Glycogen is esterified more rapidly by the above mixture of donators than by a low concn. of inorg. P (0.002*M*) and the latter process is catalysed by adenylic acid. At a concn. of 0.01*M* the inorg. P is preferred. Distinct enzymes are involved in the phosphorylation of glycogen and creatine. R. M. M. O.

Plant phosphatases. I. Phosphatase of germinated soya bean (*Glycine hispida*). K. V. GIRI (Z. physiol. Chem., 1937, 245, 185—196).—Aq. extracts of powdered germinated beans on fractional pptn. with COME<sub>2</sub> or EtOH, removal of impurities at  $p_H$  5, and dialysis or ultra-filtration yield a highly active phosphatase (I). (I) exhibits optimal activity at  $p_H$  5.1—5.5. With  $\alpha$ - (II) and  $\beta$ - (III) -glycerophosphate, the rate of hydrolysis  $\propto$  time until 10—12% of the substrate is hydrolysed, and with Na hexose diphosphate (IV) and Na<sub>4</sub>P<sub>2</sub>O<sub>7</sub> until 20% is hydrolysed. (IV) is more rapidly hydrolysed than are (II), (III), and Na<sub>4</sub>P<sub>2</sub>O<sub>7</sub> and (III) more rapidly than (II). F<sup>+</sup>, C<sub>2</sub>O<sub>4</sub>'<sup>-</sup>, Cu<sup>++</sup>, and ascorbic acid (V) but not CN<sup>-</sup> inactivate (I) to extents which vary with the

substrate used. F is more effective than  $C_2O_4^{''}$  and  $Cu^{++} + (V)$  more effective than (V) alone.

W. McC.

**Vegetable pyrophosphatases. I. Kinetics of hydrolysis of pyrophosphoric and  $\beta$ -glycerophosphoric acids.** P. FLEURY and J. COURTOIS (*Enzymologia*, 1937, 1, 377—395).—The  $p_H$  optima for both pyrophosphatase (I) and phytase (II) in seeds is 5.6—5.8, whilst the optimum for takadiastase (III) is more acidic. In seeds glycerophosphatase (IV) but not (II) activity runs parallel with (I) activity. (III) is richer in (IV) than in (I), but in emulsin (V) the distribution is reversed. In (V), (I) and (IV) are relatively thermostable, whilst in (III) they are completely inactivated at 65°. E. A. H. R.

**Biochemical hydrogenation of dehydroandrosterone.** L. MAMOLI and A. VERCELLONE (*Z. physiol. Chem.*, 1937, 245, 93—95).—Dehydroandrosterone in EtOH dropped into fermenting invert sugar at approx. 20° (top yeast) is converted into  $\Delta^5$ -androstenediol. W. McC.

**Yeast and trehalose.** K. MYRBACK (*Svensk Kem. Tidskr.*, 1937, 49, 24—26; cf. A., 1936, 759).—Pressed yeast ferments added trehalose (I) directly, but does not attack its own (I) unless previously dried. M. H. M. A.

**Separation of growth-substances stimulating yeast and fungi.** N. NIELSEN and V. HARTELIUS (*Compt. rend. trav. Lab. Carlsberg, Ser. physiol.*, 1937, 22, 1—22).—Two growth-substances are distinguished, one ( $B_1$ ) stimulating yeast and the other ( $B_2$ ) affecting *A. niger*.  $B_1$  is much less resistant to oxidising agents ( $H_2O_2$ ,  $KMnO_4$ ) than is  $B_2$ , but more resistant than the cell-extension hormone of the *Avena* coleoptile. The growth-substance obtained by heating sugar (A., 1932, 661) is very resistant. Neither  $B_1$  nor  $B_2$  is sensitive to reduction. From the mixed growth-substances  $B$  each organism preferentially absorbs its sp. substance. A method of separating  $B_1$  and  $B_2$  by this means is examined.  $B_2$ , but not  $B_1$ , requires the presence of a co-substance (metallic salt) for its activation. A. G. P.

**Effect of 2:4-dinitrophenol on cellular oxidation in yeast.** L. PLANTFOL (*Ann. Physiol. Physicochim. biol.*, 1935, 11, 32—53; *Chem. Zentr.*, 1936, i, 2575).—In sugar-free solutions 2:4-dinitrophenol (I) in suitable concns. increases cellular oxidation of beer yeast and *S. cerevisiae*. Anaerobic strains of yeast reduce (I) but there is no increase in cellular oxidation even in the presence of  $O_2$ . A. G. P.

**Analysis of growth: yeast.** O. W. RICHARDS (*Cold Spring Harbor Symp.*, 1934, 2, 157—166).—Growth of *Saccharomyces cerevisiae* follows a linear rather than a logarithmic or sigmoid course and consists of two cycles. Production of EtOH is greater at lower temp. Small amounts of TI in certain brands of asparagine lowered sugar utilisation and increased crop growth.  $H_2O$  containing  $D_2O$  (1 in 2000—4000) increased growth. CH. ABS. (*p*)

**Action of low concentrations of deuterium oxide on the course of gas production by brewer's yeast.** C. S. SHOUR and S. L. MEYER (*J. Tennessee*

*Acad. Sci.*, 1935, 10, 127—131).—0.5% of  $D_2O$  slightly retarded gas formation (2.6%) from sucrose at 30° after a period of 45—50 hr. CH. ABS. (*p*)

**Annulment of fluoride inhibition in living top yeast by adenylic acid.** J. RUNNSTROM and T. HEMBERG (*Naturwiss.*, 1937, 25, 74).—Addition of adenylic acid (I) annuls the inhibition by  $F^-$  of respiration and fermentation of living top yeast. The annulment is less marked at higher  $[F^-]$  and  $[PO_4^{''}]$ , but is promoted by  $MgCl_2$  and  $AsO_4^{''}$ . With dried top yeast, after storage for long periods, and bottom yeast, the  $F^-$  inhibition is unaffected by (I). E. A. H. R.

**Inhibition by iodoacetate of fermentation by dried yeast.** J. RUNNSTROM and F. ALM (*Naturwiss.*, 1937, 25, 74).—The irreversible inhibition of fermentation by  $CH_2I \cdot CO_2'$  (I) increases with increasing acidity. (I) interacts with the protein of the enzyme and not with the co-enzyme. Higher concns. of (I) are required for inhibition at  $p_H > 7$ . The system is protected at higher  $p_H$  vals. as the greater  $\cdot SH$  content binds more (I). E. A. H. R.

**Chemistry of death.** O. RAHN (*Cold Spring Harbor Symp.*, 1934, 2, 70—77).—In the killing of yeast cells by  $HgCl_2$ , by heat (50°), or by ultra-violet or X-irradiation, the reproductive capacity was the most sensitive to injury, fermentative capacity was secondarily affected, and plasma membrane permeability was the last factor to be injured. Death rate  $\propto$  some exponent of the concn. of the poison (4—6 for PhOH). Progeny of surviving cells showed no increased resistance to the poison. CH. ABS. (*p*)

**Sulphite fermentation under conditions of repeated utilisation of yeast.** V. S. KURBATOVA and A. N. SCHAKIN (*Biochimia*, 1936, 1, 457—466).—The yeast can be used repeatedly for sulphite fermentation of sugar to glycerol, without loss of activity, if a sulphite-free culture is interposed after each succeeding sulphite culture. The yeast cells should be separated from the medium as soon as possible after completion of fermentation. R. T.

**New black-pigmented species of *Torula*.** N. ROUCHELMAN (*Compt. rend. Soc. Biol.*, 1937, 124, 545—547).—The new *Torula Schoeni*, isolated from the aq. distillate of glycerinated yeast, produces a black pigment when grown on wort. H. G. R.

**Influence of medium on the chemical composition of *Aspergillus niger*.** R. S. HILPERT, G. FRIESEN, and W. ROSSÉE (*Biochem. Z.*, 1937, 289, 193—197).—Tables summarising yields and % N in the mycelium of *A. niger* grown on various media show that the skeletal substance of the mould changes its composition with change of medium. P. W. C.

**Influence of neutralisation of fermenting media on acid formation by *Aspergillus niger*.** V. A. KIRSANOVA (*Biochimia*, 1936, 1, 425—445).—Total acid production from sucrose by *A. niger* is greatly augmented by addition of alkali during fermentation. The optimum  $p_H$  varies from 4 to 7 for different strains of mould, whilst for all strains examined acid production approaches zero at  $p_H < 3$  or  $> 8$ . The increase in total yield of acid is due to increased

production of citric (I), oxalic, and gluconic acids. The effectiveness of different alkalis rises in the series  $\text{CaCO}_3 < \text{NaOH} < \text{Na}_2\text{CO}_3$ . Higher yields of (I) are obtained by growing the pellicle of mould in one medium, and transferring it to the sucrose medium for (I) production. The yield of  $\text{H}_2\text{C}_2\text{O}_4$  falls with increasing time of fermentation. The yield of (I) may be raised to 91% of theoretical by fermentation of 35% sucrose medium, with daily adjustment of  $p_{\text{H}}$  to 4–6, and with frequent change of the mould pellicle.

R. T.

**Influence of the antioxidants, methylene-blue and dinitrophenol, on the growth of *Aspergillus niger*.** R. BONNET and R. JACQUOT (Bull. Soc. Chim. biol., 1936, **18**, 1850–1870).—It is impossible to dissociate completely the energy required for maintenance and that for growth by incorporating in the medium substances which influence respiratory activity. Methylene-blue (I) and dinitrophenol (II) in non-toxic concns. are without effect on the gross energy yield, but at certain concns. (I) increases, and (II) decreases, the energy yield.

P. W. C.

**Chemical studies of *Rhizopus japonicus*.** H. LIM (J. Fac. Agric. Hokkaido, 1935, **37**, 165–209).—The dried fungus from cultures on Raulin's solution containing sucrose and tartaric acid as sole org. sources contained protein 38.8, crude fat 9.7, crude fibre 7.7, N-free extract 42.2, ash 5.5%. The  $\text{Et}_2\text{O}$  extract included ergosterol 1.08, fungisterol 2.55, palmitic acid 7.6, stearic acid 1.16, and phosphatides 1.19 g. per kg. The unsaturated acid consisted largely of oleic with small amounts of linoleic acid. The 95% EtOH extract of the fat-free material yielded mannitol, sucrose, trehalose, adenine, hypoxanthine, histidine, betaine, and stachydrin. Mannose (14.3%), and fructose (1.5%) were also present. A phosphoprotein *rhizopenin*, containing much tyrosine and tryptophan and having cystine-S: total S = 1:18, I val. 16.2, and isoelectric  $p_{\text{H}}$  2.9–3.0, was also isolated. The digestibility coeffs. of the fungus were, N substances 72.1, carbohydrates 78.6, and ash 74.2. Vitamin- $B_1$  and - $B_2$  (but not -A or -C) and a yeast-growth-promoting substance were detected.

CH. ABS. (p)

**Physiology of *Rhizopus oryzae*.** L. B. LOCKWOOD, G. E. WARD, and O. E. MAY (J. Agric. Res., 1936, **53**, 849–857; cf. A., 1936, 1154).—Growth and glucose consumption of *R. oryzae* were greater at 40° than at 30°; *d*-lactic acid production varied in the reverse manner. Formation of fumaric acid (I) was suppressed in media containing >6 g. of  $\text{NH}_4\text{NO}_3$  per litre. *R. oryzae* utilised  $\text{NH}_4$  salts, urea, and certain  $\text{NH}_2$ -acids as N sources.  $\text{NaNO}_3$  was unsatisfactory, and in media containing  $\text{NaNO}_3$  as sole source of N no growth was made. In presence of  $\text{CaCO}_3$ , Zn salts favoured growth of the fungus. Under favourable conditions of growth the production of (I) depended on the maturity of the mycelium.

A. G. P.

**Biochemistry of Sonti fermentation.** K. R. REDDI (Proc. Soc. Biol. Chem. India, 1937, **1**, 37–38).—The formation of glucose and EtOH in the Sonti fermentation of rice is principally due to an

organism, *Rhizopus Sontii*, but two associated yeasts supplement the EtOH production by about 50%.

W. O. K.

**Nitrogen utilisation by *Ophiobolus graminis*.** H. FELLOWS (J. Agric. Res., 1936, **53**, 765–769).—When grown in Czapek's medium *O. graminis* was unable to utilise N compounds other than ovalbumin, casein, peptone, and nucleic acid. This apparent specificity in N requirements was unrelated to the nature of the C supply, to the presence of growth-substances, or to the  $p_{\text{H}}$  of the medium. *Rhizopus* sp. and *Penicillium* sp. showed some specificity in this respect but could utilise a wider range of N compounds.

A. G. P.

**Parasitism and control of *Armillaria mellea*.** R. LEACH (Proc. Roy. Soc., 1937, **B**, **121**, 561–573).—*A. mellea*, unlike *Rhizoctonia bataticola* or *Botryodiplodia theobromae*, requires roots of high carbohydrate (I) content for free development. Bark-ringings of trees (host), a process which depletes the root-(I), is recommended as a protective measure.

F. O. H.

**Reaction of protoplasm to radium radiation.** W. SEIFRITZ (Protoplasma, 1936, **25**, 196–200).—The protoplasm of slime moulds was highly resistant, but was killed by 20 hr. continuous radiation from nine 12-mg. needles at a distance of 1 mm. Less intense radiation stimulated growth. Immediately around the needles the protoplasm showed a finer grain than elsewhere.

M. A. B.

**Population growth in protozoa.** T. L. JAHN (Cold Spring Harbor Symp., 1934, **2**, 167–180).—Various protozoa show similar growth responses to external conditions, changes in availability of  $\text{O}_2$  and food, elimination and neutralisation of waste products, and oxidation-reduction potential.

CH. ABS. (p)

***Amoeba proteus* as material for study of cell growth and division.** H. W. CHALKLEY (Cold Spring Harbor Symp., 1934, **2**, 89–93).—The organism is particularly suitable for the purpose. Effects of glutathione on cell division are described. Cystine and cysteine affect division but glycine is inert.

CH. ABS. (p)

**Bacterial fermentation and structure of glucosamine.** A. G. WEDUM and A. W. WALKER (J. Infect. Dis., 1935, **57**, 160–163).—Many species of bacteria which ferment glucose (I) and not (or less readily) mannose (II) also ferment glucosamine (III). (III) probably contains the (I) structure. *Torula cremoris* fermented (I) and (II) but not (III).

CH. ABS. (p)

**Properties of an essential growth factor for pathogenic bacteria.** F. SAUNDERS, I. I. FINKLE, L. STERNFELD, and S. A. KOSER (J. Amer. Chem. Soc., 1937, **59**, 170–174).—Many plant and animal tissues (e.g., calf spleen and liver) contain a S-free substance (I) (method of isolation described), which is essential for the growth of various pathogenic bacteria. (I) is sol. in  $\text{H}_2\text{O}$ , MeOH, EtOH, and PhOH but is largely insol. in higher alcohols,  $\text{Et}_2\text{O}$ ,  $\text{CHCl}_3$ , and  $\text{C}_6\text{H}_6$ . (I) is unaffected by aeration, 3%  $\text{H}_2\text{O}_2$ , and ammoniacal  $\text{AgNO}_3$ ; solutions are thermostable. Slight loss of activity occurs with

cold  $\text{Br-H}_2\text{O}$ ,  $\text{HNO}_2$ , or  $\text{Ac}_2\text{O-NaOAc}$  at  $100^\circ$ . (I) is not inorg. since it destroyed by wet and dry ashing. Moulds grown on Czapek-Dox medium will synthesise (I). H. B.

**Tryptophan and "sporogenes vitamin" requirements of *Cl. botulinum*.** P. FILDES (Brit. J. Exp. Path., 1935, 16, 309—314).—Normal strains require both tryptophan and the "vitamin" before growth can take place. CH. ABS. (p)

**Essential growth factor for *Staphylococcus aureus*.** B. C. J. G. KNIGHT (Brit. J. Exp. Path., 1935, 16, 315—326).—The growth factor is a weak base yielding relatively sol. compounds with many base precipitants, and distilling at  $>105^\circ/0.001$  mm. *S. aureus* grows aerobically on media containing acid-hydrolysed gelatin, tryptophan, tyrosine, cystine, and glucose, supplemented with the growth substance. The latter is also essential for *B. anthracis*.

CH. ABS. (p)

**Carbon dioxide as an essential factor in growth of bacteria.** G. P. GLADSTONE, P. FILDES, and G. M. RICHARDSON (Brit. J. Exp. Path., 1935, 16, 335—348).—Continuous passage of  $\text{CO}_2$ -free gases through cultures of various bacteria caused no change in growth of certain species but inhibited others. Inhibition is ascribed to removal of  $\text{CO}_2$  from the cultures, and failure to inhibit resulted from production of  $\text{CO}_2$  by the organisms at a rate  $>$  that of removal by the gas stream.  $\text{CO}_2$  is essential for all bacteria and is produced by the organisms prior to growth.

CH. ABS. (p)

**Dependence of bacterial growth on the nature of the nitrogen-containing constituents of the medium.** D. A. ZUVERKALOV and V. M. KRASOV (Biochimia, 1936, 1, 295—300).—Bacteria of the paratyphoid group, which have only weak proteolytic activity, grow feebly in media containing pure protein but vigorously when the protein is hydrolysed.

W. O. K.

**Necessity of sulphur compounds for bacterial glycolysis.** P. CHAIX and C. FROMAGEOT (Enzymologia, 1937, 1, 321—327; cf. A., 1936, 760, 1561).—Substances activating glycolysis by *Propionibacterium pentosaceum* are examined.  $\text{H}_2\text{S}$  and org. thio-compounds are the strongest activators.

E. A. H. R.

**Mechanism of action of sulphur compounds on glycolysis by *Propionibacterium pentosaceum*.** P. CHAIX (Compt. rend., 1936, 203, 1396—1398; cf. A., 1936, 760).—*P. pentosaceum* contains a system X which diffuses into the medium and effects glycolysis. The "active limiting amount" of the bacteria is that amount below which glucose in the medium is no longer attacked, due to an insufficiency of X. Cystine (I), thiourea, and  $\text{H}_2\text{S}$  simply replace the deficiency of X, and do not increase the normal activity of the cells. Five successive saline washings and fermentations lowered the activity of a culture by almost 50%, but on addition of (I), the rate of glycolysis became normal. Nine washings and fermentations completely inactivated the bacteria, and activity was not restored by (I).

J. N. A.

**Pure culture studies of the sulphur organism *Thiobacillus* (sp. novo.).** P. D. KARUNAKAR and T. RAJAGOPAL (Proc. Soc. Biol. Chem. India, 1937, 1, 12—13).—The cultural appearance and general properties of *Thiobacillus* (sp. novo.) isolated from the soil at Coimbatore are described. W. O. K.

(A) Influence of  $p_{\text{H}}$  on growth of purple sulphur bacteria. (B) Growth of purple sulphur bacteria in organic acids. V. A. TSCHESNOKOV and D. I. SAPOSHNIKOV (Biochimia, 1936, 1, 63—74, 157—164).—(A) The optimum  $p_{\text{H}}$  for growth of *Ectothiorhodospira mobile*, Pelsch, varies according to the source of S, being 7.4 for  $\text{NaHSO}_3$ , 7.5 for  $\text{Na}_2\text{S}_2\text{O}_3$ , 8.5 for S, and 9 for  $\text{Na}_2\text{S}$ ; the  $p_{\text{H}}$  and the degree of oxidation of the available S vary inversely. The effects are ascribed to the different  $E_{\text{H}}$  of the media.

(B) Growth in media containing org. acids in place of S, and the optimum  $p_{\text{H}}$ , vary inversely with the O content of the acid, in the series: valeric  $>$  butyric  $>$  propionic  $>$  acetic  $>$  glycolic  $>$  oxalic acid; butyric  $>$  succinic  $>$  malic  $>$  tartaric acid. R. T.

**Characteristic lipochromes of fluorescent bacteria.** F. GIRAL (Anal. Fis. Quim., 1936, 34, 667—693).—The formation and properties of the fluorescent colouring matters produced in the normal metabolism of *B. pyocyaneus*, *B. fluorescens*, and *B. putidus*, and the effect of  $p_{\text{H}}$  and various reagents on the colour, have been studied. Chromatographic adsorption analysis shows the presence of two pigments, one of which is probably identical with pyorubin, and the other, to which the characteristic properties of the original are due, seems to be intermediate between flavin and xanthopterin. The yellow colouring matter of old potatoes is not identical with the bacterial pigment and is more likely a pterin.

L. A. O'N.

**Bacteriological and biochemical relationships in *Pyocyanus fluorescens* group. II. Green fluorescent pigment.** G. E. TURFITT (Biochem. J., 1937, 31, 212—218; cf. A., 1936, 1154).—The empirical formula of the green pigment is  $\text{C}_4\text{H}_7\text{O}_2\text{N}$ . Methods for its isolation from various organisms in the group are described. In alkaline solution there is a well defined band with absorption max. at  $410 \text{ m}\mu$ ; on acidification, the band becomes less marked with max. at  $370 \text{ m}\mu$ , and is shifted towards the shorter

J. N. A.

**Antagonism between *B. fluorescens* and *B. pyocyaneum*.** H. O. HETTCHE and W. VOGEL (Arch. Hyg. Bakt., 1937, 117, 234—244).—Two types of *B. fluorescens* having optimum growth temperatures of  $22^\circ$  and  $37^\circ$  were isolated. In liquid and solid media, cultures of *B. pyocyaneum* at  $37^\circ$  showed a strong bactericidal action against *B. fluorescens*. The effect  $\propto$  the amount of colour produced in the case of young, but not in old, cultures.

W. L. D.

**Luminescence of bacteria. II. Oxygen consumed in the light-emitting process of *Photobacterium phosphoreum*.** J. G. EYMERS and K. L. VAN SCHOUWENBURG (Enzymologia, 1937, 1, 328—340).—The inhibiting effects of KCN on  $\text{O}_2$  consumption and light intensity indicate that the total respiration consists of a hæmin respiration, a

respiration associated with the light-emitting process and forming a const. % of the total, and a "rest" respiration. The quantum efficiency of the light-emitting process is a function of temp. It is highest at 22° (one quantum per 195 mols. of  $O_2$  consumed).

E. A. H. R.

**Effect of carbohydrates and allied substances on urease production by *Proteus vulgaris*.** R. PASSMORE and J. YUDKIN (Biochem. J., 1937, 31, 318—322).—The production of urease (I) by *P. vulgaris* is increased (by 100 and 40%, respectively) by addition to the medium of arabinose and glycerol. Fructose and galactose also sometimes increase (I) production whilst glucose and lactate lower it by approx. 50%. Jacoby's conclusion (A., 1918, i, 469) that the group  $\cdot CH(OH)\cdot CH(OH)\cdot CHO$  is essential for (I) production is not confirmed.

W. McC.

**Relation between the peptone utilised and indole produced by bacteria.** A. MUSTAFA (Compt. rend. Soc. Biol., 1937, 124, 450—451).—Martin's peptone is the most suitable for the production of indole.

H. G. R.

**Yield of indole from indole-producing bacteria and the composition of the peptone medium.** A. MUSTAFA (Compt. rend. Soc. Biol., 1937, 124, 514—515).—Reducing sugars and  $NO_3^-$  retard indole production.

H. G. R.

**Influence of boric acid on acetic fermentation.** M. NICULESCU (Bull. Soc. Chim. biol., 1936, 18, 1831—1841).— $H_3BO_3$ , added in small amounts (0.0125—0.0375%) to a synthetic culture medium, promotes the formation of AcOH, but larger amounts are toxic, the toxicity, however, being decreased by the presence of substances (e.g., glucose) which combine with the acid.

P. W. C.

**Effect of sodium iodoacetate on the respiration of *Staphylococcus aureus*.** F. CHODAT and G. CARRISSON (Arch. Sci. phys. nat., 1936, 18, Suppl., 139—141).—The  $O_2$  uptake of *S. aureus* is progressively inhibited by increasing concn. of  $CH_3I\cdot CO_2Na$ , from about 6% at  $2 \times 10^{-5}M$  to 46% at  $10^{-3}M$ .

F. A. A.

**Sensitivity of *Azotobacter* in soil to the structure of the monohydroxybenzoic acids.** G. GUITTONNEAU and R. CHEVALIER (Compt. rend., 1936, 203, 1400—1402; cf. A., 1936, 1422).—Using four types of *Azotobacter* on  $SiO_2$  gel containing the Na salts of *o*-, *m*-, and *OH\cdot C\_6H\_4\cdot (O\_2H)*, three of the types were active in presence of the *p*-, one in presence of the *o*-, and none in presence of the *m*-compound. The last has no toxic action, bacteria remaining inactive in its presence, growing normally if transferred to a gel containing NaOBz.

J. N. A.

**Economy of carbon during fixation of nitrogen by *Azotobacter chroococcum*.** T. R. BHASKARAN (Proc. Soc. Biol. Chem. India, 1937, 1, 6).—The fixation of atm.  $N_2$  by *A. chroococcum* does not seem to depend on the utilisation of org. acids derived from glucose. It therefore differs from  $N$  fixation in the soil by a mixed bacterial flora.

W. O. K.

**Cell inclusions and the life cycle of *Azotobacter chroococcum*.** I. M. LEWIS (Science, 1937, 85, 16).—

The colourless granules are fat bodies whilst the stainable granules consist of volutin.

L. S. T.

**Formation of  $\beta$ -alanine from aspartic acid by legume bacteria.** A. I. VIRTANEN and T. LAINE (Suomen Kem., 1937, 10, B, 2).—About 50% of the org. N excreted from the nodules of leguminous plants is *l*-aspartic acid (I). 1—2% of the remainder is oxime-N whilst the major part, precipitable with phosphotungstic acid, is  $\beta$ -alanine (II). The root-nodule bacteria eliminate  $CO_2$  from (I) forming (II).  $NH_2$ -acids are excreted by the nodules and not by the roots.

E. A. H. R.

**Polysaccharide synthesis by "nitrogen-fixing" organisms.** E. A. COOPER and J. F. PRESTON (J.S.C.I., 1937, 56, 1—5T).—*Rhizobium radicicolum* synthesises a gum, which is a glucose-glycuronic acid complex, from mono-, di-, and poly-saccharides, and also from polyhydric alcohols, containing 3, 5, and 6 C, and from Na lactate, malonate, and succinate. Amides and  $NH_2$ -acids are not suitable C sources for gum-production. *Azotobacter chroococcum* also synthesises a polysaccharide from diverse C compounds, and the conditions of formation resemble those holding in the case of *R. radicicolum*. These organisms are unable to form polysaccharides in culture media containing high concns. of sugars, and in this respect they differ from the bacilli and *Leuconostoc*.

**Nodule bacteria. VI. Influence of different parts of plants on growth of nodule bacteria.**

**VII. Influence of extracts of nodules.** A. ITANO and A. MATSUURA (Ber Ohara Inst. landw. Forsch., 1936, 7, 359—377, 379—401; cf. A., 1936, 1301).—VI. Extracts of various plant organs affected the growth of nodule bacteria in the relative order, nodules > stems > leaves > roots > seeds from fresh plants. For dried plants the order was the same except that root extracts were more potent than those of stems. No relation exists between the N content of aq. extracts and their action on bacterial growth.

VII. Extracts made with single solvents and those obtained by fractional extraction with several solvents are examined. Alkaloids occur in extracts which markedly stimulate the growth of nodule organisms.

A. G. P.

**Separation and biological activity of the polysaccharide constituent in *Brucella* cells.** A. D. HERSHEY, I. F. HUDDLESTON, and R. B. PENNELL (J. Infect. Dis., 1935, 57, 183—185).—From the crude prep. (Favilli and Biancalani) of the sp. pptg. polysaccharide from *B. abortus* a non-polysaccharide (I)-pptg. fraction was obtained. A similar substance was prepared from a (I) antigen of *Brucella* cells by cleavage. The pptg. property of Favilli's prep. is due to (I).

CH. ABS. (p)

**Change in fermentation reactions of a dysentery bacillus by passage through animals.** M. ARTOFF (Compt. rend., 1936, 203, 1548—1550).—Passage of a dysentery bacillus which gave the typical fermentation reactions of *B. Flexneri* through mice, rats, guinea-pigs, or rabbits, produced a strain which gave the typical reactions of *B. Shigae*. Passage through an animal is necessary for the change,

and it has not been possible to reverse the process. Serum from a rabbit immunised with the "*Shigae*" strain caused a more pronounced agglutination of the "*Flexneri*" than of the "*Shigae*" strain, and the latter was agglutinated more readily by serum from a rabbit immunised with the "*Flexneri*" strain.

J. N. A.

**Biocatalytic properties of iron oxides.**—See A., I, 192.

**Bacterial variation and complete somatic O antigen.** A. BOIVIN and L. MESROBEANU (Compt. rend., 1936, 203, 1402—1404).—The following variants of *B. aertrycke* have been separated: rough immotile, rough motile, smooth immotile, and smooth motile in sp. and non sp. phases. Only the three smooth variants contain the O antigen, which forms in each case about 8—9% of the dry wt. of the bacteria. All these O antigens have the same chemical composition (40% of carbohydrate and 20% of fatty acid) and are identical in every respect. The presence or absence of the H antigen, or variations in its specificity, have no effect whatever on the O antigen.

J. N. A.

**Hæmolysin from a strain of animal streptococci.** H. LOEWENTHAL and M. G. PRADHAM (Brit. J. Exp. Path., 1935, 16, 230—236).—The serum-free hæmolysin of streptococci from an animal infection was subject to reversible oxidation and reduction.

CH. ABS. (p)

**Pathogenic power and filterable forms of bacteria.** R. NATIVELLE (Compt. rend. Soc. Biol., 1937, 124, 225—227).—The filterable forms of *B. gangrenæ* become pathogenic only after 10—12 days and the vaccines prepared from them have immunising properties, in contrast to those prepared from the "adult" form.

H. G. R.

**Spectroscopic investigation of bacterial toxins: absorption spectra of products of *C. diphtheriæ*.** A. WADSWORTH, M. O'L. CROWE, and L. A. SMITH (Brit. J. Exp. Path., 1935, 16, 201—217).—The toxin and substances giving selective absorption bands corresponding with that of the porphyrins are produced or liberated by *C. diphtheriæ* under similar conditions. The absorbing substances may be separated from the toxin by ultrafiltration or by adsorption on C.

CH. ABS. (p)

**Production of enterotoxic substance by bacteria.** E. O. JORDAN and W. BURROWS (J. Infect. Dis., 1935, 57, 121—128).—Production of toxic filtrates was increased by growth on a starch medium.

CH. ABS. (p)

**Bacteriophage. I. Extraction with ether.** II. Artificial production of a specific lytic agent behaving like bacteriophage. J. D. LEMAR and J. T. MYERS (J. Infect. Dis., 1935, 57, 1—5, 6—11).—I. Bacteriophage can be extracted, wholly or in part, by Et<sub>2</sub>O from an aq. phase.

II. Incubation, autoclaving, secondary incubation, and treatment of bacterial cultures with H<sub>2</sub>O<sub>2</sub> yielded lytic filtrates of high potency. No active filtrate was obtained if the secondary incubation was omitted unless oxidation was prolonged for several days. Filtrates from autoclaved cultures incubated a second

time but not oxidised, and those obtained from direct oxidation of living cultures, were not active. The lytic agent was destroyed by exposure to 75° for 30 min. but not by repeated freezing and thawing in solid CO<sub>2</sub>.

CH. ABS. (p)

**Reversible inactivation of bacteriophage with safranin.** A. P. KRUEGER and D. M. BALDWIN (J. Infect. Dis., 1935, 57, 207—211).—Addition of safranin to a broth-suspension of anti-staphylococcus bacteriophage at  $p_H$  7.4 produces a ppt. which inactivates the phage. The inactivation is, in part, a photodynamic effect. Dissolution of the ppt. at  $p_H$  6.5 causes partial reactivation of the phage.

CH. ABS. (p)

**Inactivation of bacteriophage by bacteria.** V. SERTIC (Compt. rend. Soc. Biol., 1937, 124, 218—220).—The inactivating substance (probably a polysaccharide) can be washed out of a gelatin culture with broth and is moderately heat-stable. H. G. R.

**Serological reactions of potato-virus "X."** E. T. C. SPOONER and F. C. BAWDEN (Brit. J. Exp. Path., 1935, 16, 218—230).—Saps of tobacco, *Datura stramonium*, and potato infected with virus X contain a common antigen. Serological reactions with rabbit sera are described.

CH. ABS. (p)

**Reaction of the viruses of tomato spotted wilt and tobacco mosaic to the  $p_H$  of the medium.** R. J. BEST and G. SAMUEL (Ann. Appl. Biol., 1936, 23, 509—537).—Suspensions of the virus of tomato spotted wilt, buffered to  $p_H$  7.0 at 0° and in the absence of O<sub>2</sub>, retain their activity for <6 hr., but are rapidly inactivated at  $p_H$  <5 or >10. Tobacco mosaic virus is inactivated at  $p_H$  <2 or >8. Activity- $p_H$  curves resemble those of enzymes rather than those of living organisms.

A. G. P.

**Isolation of crystalline tobacco mosaic virus-protein from tomato plants.** H. S. LORING and W. M. STANLEY (J. Biol. Chem., 1937, 117, 733—754).—A detailed account of earlier work (A., 1936, 525). The proteins from tomato and tobacco plants possess the same infectivities, have the same serological properties, chemical composition,  $[\alpha]$ , and isoelectric point, and give the same sedimentation const. Repeated fractionation with celite at  $p_H$  4.5 and 8 results in a gradual inactivation of the virus-protein. Tobacco mosaic virus reaches a concn. > that of the virus of tomato plants.

P. W. C.

**Virus of tobacco mosaic. IX. Correlation of virus activity and protein on centrifugation of protein from solution under various conditions.** W. M. STANLEY (J. Biol. Chem., 1937, 117, 755—770; cf. A., 1936, 1562).—Ultracentrifuging of solutions of mixtures of tobacco mosaic virus-protein and tobacco proteins, ovalbumin, trypsin, and pepsin resulted in the sedimentation of the high-mol. wt. virus-protein as a cryst. mass at the bottom of the tube and in the concn. of virus activity in this protein. Fractional centrifuging at varying  $p_H$  gave similar results, the virus activity always remaining with the protein of high mol. wt.

P. W. C.

**Stream double refraction of preparations of crystalline tobacco-mosaic protein.** W. N. TAKAHASHI and T. E. RAWLINS (Science, 1937, 85, 103—

104).—Suspensions of visible crystals of two preps. in  $(\text{NH}_4)_2\text{SO}_4$  produce stream double refraction as well as colloidal buffered solutions of the crystals. The cryst. preps. are probably pure virus which thus exhibits this refraction and, when in solution, is composed of submicroscopic rod-shaped particles. The dilution at which stream double refraction becomes undetectable and the active virus concn. depend on  $p_{\text{H}}$ .  
L. S. T.

**Inactivation of poliomyelitis virus *in vitro* by ascorbic acid.** C. W. JUNGBLUT (J. Exp. Med., 1935, 62, 517—521).—Multiple paralytic doses of the virus are rendered non-infectious to *Rhesus* monkeys by addition of small amounts of ascorbic acid.  
CH. ABS. (p)

**Antisepsis.** J. KORINEK (Casopis ceskoslov. Lek., 1935, 15, 203—206; Chem. Zentr., 1936, i, 2590).—0.1% of  $p\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{Et}$  inhibits growth of *B. coli*, *Penicillium*, *Saccharomyces cerevisiae*, etc.  
H. N. R.

**Destruction of *M. tuberculosis* by some proprietary disinfectants.** P. UHLENHUTH and E. REMY (Arch. Hyg. Bakt., 1936, 117, 131—138).—The capacities of certain proprietary disinfectants (German) for killing tubercle bacilli in sputum have been investigated.  $\text{CH}_3\text{O}$  and phenolic preps. were successfully used.  
W. L. D.

**Oligodynamic action of silver on typhus vaccine.** T. UGLOWA (Arch. Hyg. Bakt., 1936, 117, 144—152).—The oligodynamic action of Ag-Mn is 10 times that of Ag on *B. typhi*. For immunising purposes the vaccine treated with Ag is not superior to the ordinary vaccine. The Ag-vaccine kept its potency and biological properties for  $\approx 9$  months.  
W. L. D.

**Biochemistry of the lower organisms. I. Protective action of casein in the poisoning of bacteria by nicotine.** H. LEONTJEV and E. TRUSCHINA (Protoplasma, 1936, 25, 211—219).—Nicotine (I) (1.25%) in Ringer solution at 35—38° killed *Staphylococcus albus* in 24 hr. and *B. dysenteriae* in 1 hr. Addition of casein destroyed the toxicity of (I).  
M. A. B.

**Bacteriostatic action of skatole on Gram-negative enteric bacilli.** R. P. TITSLER, L. A. SANDHOLZER, and E. T. CALLAHAN (J. Infect. Dis., 1935, 57, 57—60).—Growth of the organisms was inhibited by skatole (I) (1 in 3000—4500). The bacteriostatic action of (I) was approx. double that of indole.  
CH. ABS. (p)

**Bacteriostatic action of indole on Gram-negative enteric bacilli and certain cocci.** R. P. TITSLER and L. A. SANDHOLZER (J. Infect. Dis., 1935, 57, 64—69).—Bacterial growth was inhibited by indole (I) in dilutions of 1 in 1500—2000. The sensitivity of a no. of species to (I) is examined: related species cannot be differentiated in this way. Sensitivity to (I) and the production of (I) by bacteria were unrelated.  
CH. ABS. (p)

**Bactericidal effect of hirudin and heparin. I. Intravenous injection and leeching in experimental bacteræmia.** A. OCHSNER and H. R. MAHORNER (Arch. Surg., 1935, 31, 308—314).—Hiru-

din is possibly beneficial but heparin increases mortality in staphylococcal bacteræmia.  
CH. ABS. (p)

**Germicidal action of combined solutions of potassium permanganate and mercury oxy-cyanate.** F. VARGA (Magyar orvosi Arch., 1935, 36, 237—243; Chem. Zentr., 1936, i, 1916—1917).—Mixtures are more effective than either of the components.  
H. N. R.

**Cryptotoxic and bactericidal action of soaps.** M. BELIN and J. RIPERT (Compt. rend. Soc. Biol., 1937, 124, 612—614).—Na and triethanolamine soaps of oleic, linoleic, and ricinoleic acids have a strong cryptotoxic action. Variations in the relative bactericidal powers were observed depending on the substrate. Abietic soaps are less bactericidal except when a ricinoleate-resistant organism is used.  
H. G. R.

(A) Hypersensitivity and increased resistance of bacteria towards antiseptics. (B) Vital staining of bacteria on substrates containing dyes. A. HEGEDUS (Magyar orvosi Arch., 1935, 36, 395—398, 399—404; Chem. Zentr., 1936, i, 2576).—(A) The extreme sensitivity or resistance of certain bacteria to antiseptic dyes is examined.

(B) Absorption of dyes from media by living bacteria follows the laws of physical absorption, irrespective of the sensitivity of the organisms to the bactericidal action of the dyes.  
A. G. P.

**Oxygen consumption during lysis of bacteria (*M. lysodeikticus*) by lysozyme.** L. R. ZUBKOVA (Biochimia, 1936, 1, 560—566).—The O intake of cultures of *M. lysodeikticus* increases >200% during 10—20 min. after introduction of lysozyme, and falls practically to zero after completion of bacteriolysis.  
R. T.

**Benzidine blood agar (Penfold) for isolating *S. scarlatinae*.** R. TUNNICLIFF (J. Infect. Dis., 1935, 57, 147—148).  
CH. ABS. (p)

**Relation between spleen and various endocrine organs as indicated by inorganic salt metabolism. I, II.** H. KANEKO (Sei-i-Kwai Med. J., 1934, 53, No. 12, 1—23, 54, No. 1, 79—110).—The effect of injection of hormones on the mineral contents of blood and urine of normal and splenectomised rabbits is examined. Hypophorin and pituitrin act synergistically with the spleen and thyroxine is antagonistic. Pituglandol is antagonistic to the spleen in respect of  $\text{Na}^+$  and  $\text{Cl}^-$ , but is synergistic in regard to K, Ca, and Mg metabolism, cell counts, and hæmoglobin (I) content. Insulin acts similarly except in relation to Ca. Adrenaline is synergistic to the spleen in all salt metabolism except Na; spermatin is synergistic in respect of salt metabolism and white cells, but antagonistic in regard to red cells and (I) content.  
CH. ABS. (p)

**Adrenaline content and physiological activity of adrenal extracts.** H. G. REES (Quart. J. Pharm., 1936, 9, 659—668).—The use of the Folin (A., 1913, ii, 163) and  $\text{K}_2\text{S}_2\text{O}_8$  methods (cf. Barker *et al.*, A., 1933, 320) for the determination of adrenaline (I) alone and in presence of ascorbic acid is described. The contents of (I) in desiccated, frozen, or fresh adrenal

glands given by these methods agree with vals. found by biological assays, no evidence being afforded of the presence of an (I)-like substance of a different physiological activity (cf. Svirbely and Szent-Gyorgyi, A., 1932, 546). F. O. H.

**Biological test of adrenal preparations with white rats and mice.** G. WIDSTROM (Acta med. Scand., 1935, 87, 1—13; Chem. Zentr., 1936, i, 1902).—Details of the technique are given.

A. G. P.

**Action of adrenaline on the perfused liver.** J. L. D'SILVA (J. Physiol., 1936, 87, 181—188).—K is liberated by a single injection of adrenaline from the saline-perfused cat's liver, the reaction occurring in the almost entire absence of O<sub>2</sub> and being complete in 1 min. Subsequent injections at 5—15 min. intervals give only small reactions. Blood restores the reaction and when perfused continuously prolongs it for about 6 min. for the first injection, subsequent injections at 5—15 min. intervals liberating comparatively large amounts of K. R. N. C.

**Responses of normal and hypophysectomised rabbits to adrenaline.** C. BACHMAN and G. TOBY (J. Physiol., 1936, 87, 1—10).—Subcutaneous injection of adrenaline (I) in hypophysectomised animals causes hypoglycaemia only if glycogen (II) storage is maintained in the liver by feeding. Whilst hyperglycaemia in normal animals is due to breakdown of muscle-(II), the impairment of the reaction in hypophysectomised animals is probably due to its relative fixation. Depot fat accumulates in hypophysectomised and castrated animals—the latter respond normally to (I)—but not in thyroidectomised animals.

R. N. C.

**Action of adrenaline on serum-potassium.** J. L. D'SILVA (J. Physiol., 1936, 86, 219—228).—Adrenaline injected intravenously into cats causes an increase in serum-K, which is mobilised from the liver. Ca and Na are unaffected. Liver-K in rats is independent of the glycogen storage. Insulin decreases serum-K in cats only in large doses.

R. N. C.

**Adrenaline and blood-potassium.** A. D. MARENZI and R. GERSCHMAN (Compt. rend. Soc. Biol., 1937, 124, 382—383).—Adrenaline liberates K in the liver and thus increases plasma-K which, on fixation by the muscles, subsequently falls below the normal val. This action is intensified by cocaine and decreased by yohimbine and ergotamine. H. G. R.

**Corticosterone, a crystallised compound with the biological activity of the adrenal-cortical hormone.**—See A., II, 105.

**Factors influencing survival of rats after adrenalectomy and the suitability of the young rat for testing the potency of adrenal cortex extracts.** R. A. CLEGHORN, S. M. M. CLEGHORN, M. G. FORSTER, and G. A. McVICAR (J. Physiol., 1936, 86, 229—249).—The survival period is influenced by the age and strain of the animals; it is increased by the addition of bread to the diet, even when the NaCl content of the diet is reduced to 1%, suggesting that carbohydrate is also effective in prolonging life. The young rat is not suitable for testing cortical extracts.

R. N. C.

**Biological assay of the cortical hormone by the survival method in adrenalectomised young rats, and the influence of the salt content of the hormone extract.** P. SCHULTZER (J. Physiol., 1936, 87, 222—236).—The survival period is lengthened slightly by injection of 0.9% NaCl without cortical hormone (I). Rats injected with small doses of (I) survive for a longer period if the vol. of 0.9% NaCl is increased for the same dose. The gain in wt. is not related to the dose of (I). R. N. C.

**Biological test for the corticotrophic hormone.** A. JORES and H. BECK (Z. ges. exp. Med., 1936, 97, 622—629; Chem. Zentr., 1936, i, 2580).—The method is based on the increase in wt. of mouse adrenals per unit body-wt. produced by injection of the active material. A. G. P.

**Effect of hypophysectomy on natural resistance of adult albino rats to histamine poisoning.** D. PERLA and S. H. ROSEN (Arch. Path., 1935, 20, 222—232).—Decreased resistance following hypophysectomy in rats is secondary to atrophic changes in the adrenal cortex due to withdrawal of the adrenotropic hormone of the anterior lobe. Repeated injection of the cortical hormone increased resistance to histamine. CH. ABS. (p)

**"Carbohydrate hormone" of the anterior pituitary in blood in glycogen-storing diseases.** W. HERTZ (Z. Kinderheilk., 1935, 57, 525—531; Chem. Zentr., 1936, i, 1901).—The hormonal activity of blood-sera of children afforded no proof that the anterior pituitary is concerned in diseases involving glycogen accumulation. A. G. P.

**Anterior pituitary extracts and liver-fat.** C. H. BEST and J. CAMPBELL (J. Physiol., 1936, 86, 190—193).—The EtOH-insol. fraction of an alkaline extract of ox anterior pituitary, administered to fasting white rats, causes a marked increase in liver-fat, a fall in total body-fat, and an increased ketonuria. The effects are less marked in fed rats. Posterior pituitary, liver, and pancreas extracts similarly prepared produce only slight effects. The rise of blood-ketones produced in thyroidectomised rabbits by another anterior pituitary prep. does not occur when hypothyroidism becomes advanced, but reappears after thyroid feeding. R. N. C.

**Action of the pancreatropic hormone of the anterior pituitary in animals.** K. J. ANSELMINO, L. HEROLD, and F. HOFFMANN (Z. ges. exp. Med., 1935, 97, 329—335; Chem. Zentr., 1936, i, 2762).—The hormone stimulated the growth and activity of the islets of Langerhans (cf. A., 1934, 701).

A. G. P.

**Effect of extracts of pituitary body on inorganic salts in the blood of normal and hypophysectomised dogs.** S. NISHIDA (Sei-i-Kwai Med. J., 1935, 54, No. 3, 29—41).—Injection of pituitrin, antuitrin, or pituglandol into normal dogs increases blood-Cl', -K, and -Mg but decreases -Na and -Ca. Hypophysectomy produces changes of a reverse nature in Cl, K, Mg, and Ca; the injections reverse these effects. Blood-Na is decreased by hypophysectomy and further increased by injections.

CH. ABS. (p)

**Effect of salt saturation on the urinary response to pituitary (posterior lobe) extract.** K. I. MELVILLE (*J. Physiol.*, 1936, **87**, 129—143).—The diuretic response in dogs is increased by previous administration of NaCl, KCl, or NaNO<sub>3</sub>, but not by Na<sub>2</sub>SO<sub>4</sub>. R. N. C.

**Action and fate of injected posterior pituitary extracts in the decapitated cat.** A. M. JONES and W. SCHLAPP (*J. Physiol.*, 1936, **87**, 144—157).—The pressor (I) and oxytocic hormones disappear from the circulation at the same rate, 85% being lost in 20 min. and the whole in 2 hr. Blood dilution does not occur. About 30% of (I) appears in the urine. The hormones are destroyed somewhat rapidly by incubation with glycerol extracts of liver, kidney, and spleen, and slowly with whole blood, but not with incoagulable plasma. R. N. C.

**Inhibition of water diuresis by pituitary (posterior lobe) extract and its relation to the water load of the body.** M. PICKFORD (*J. Physiol.*, 1936, **87**, 291—297).—The H<sub>2</sub>O load over a certain range is roughly inversely  $\propto$  the % inhibition of the rate of urine flow from intravenous injection of post-pituitary extract. R. N. C.

**Function of the pigment hormone in warm-blooded organisms. I. Effect of the hormone on temperature and blood-sugar following inter-ventricular injection in rabbits.** A. JORES (*Z. ges. exp. Med.*, 1935, **97**, 207—213; *Chem. Zentr.*, 1936, i, 2130).—Intracerebral or intravenous injection of alkaline extracts of posterior pituitary lowers body-temp. and increases blood-sugar (I). The effects are unaltered by preliminary irradiation of the extracts with ultra-violet light. In atropinised rabbits and in narcosis the effect on body-temp. is diminished and that on (I) is unchanged. The hormone is probably the parasympathetic hormone and, in mammals, is antagonistic towards adrenaline. A. G. P.

**Variations in hormone content of the pituitary with alternation of light and darkness.** A. JORES (*Klin. Woch.*, 1935, **14**, 1713—1716; *Chem. Zentr.*, 1936, i, 1901).—The melanophore-hormone content increased during darkness to extents which apparently differed with the method of extraction. In darkness the hormone occurs in the gland in the form of an inactive precursor. Variations in other hormones are also examined and discussed. A. G. P.

**Sex and cells. I—III.** A. PARTOS (*Z. ges. exp. Med.*, 1934, **95**, 95—103; 1935, **95**, 322—330, 331—340; *Chem. Zentr.*, 1936, i, 2379).—II. Effects of phloridzin on sugar content of corpuscles are examined.

III. Administration of heterologous sexual hormones to phloridzinised dogs of both sexes produced changes in corpuscle sugars characteristic of the sexes. No change occurred after castration and destruction of the anterior pituitary. A. G. P.

**Hormone of pregnancy urine and cholesterol.** L. GROGLIA (*Boll. Soc. ital. Biol. sperim.*, 1936, **890**—**892**; *Chem. Zentr.*, 1936, i, 2380).—The change in blood-cholesterol in young rabbits following injection of pregnancy urine is directly

related to the folliculin content of the urine in the various stages of pregnancy. A. G. P.

**Menstruation with "artificial" corpus luteum hormone.** C. KAUFMANN (*Klin. Woch.*, 1935, **14**, 778—779; *Chem. Zentr.*, 1936, i, 2127).—The "artificial" hormone prepared from stigmaterol produced an apparently normal menstruation in a castrated female (with atrophied uterine mucus membrane) following preliminary treatment with dihydrofolliculin benzoate. A. G. P.

**Maintenance of pregnancy in the hypophysectomised rabbit with progestin.** J. M. ROBSON (*J. Physiol.*, 1936, **86**, 415—424). R. N. C.

**Œstradiol benzoate therapy in depressions at the menopause.** M. S. JONES, T. N. MACGREGOR, and H. TOD (*Lancet*, 1937, **232**, 320—322).—Injections of œstradiol benzoate (I) cured in certain cases the depressive illness which accompanies the menopause. Excessive amounts of gonadotropic hormone in the urine were reduced by (I). L. S. T.

**Response of the uterus of immature rabbits to œstrone.** M. K. MCPHAIL (*Quart. J. Pharm.*, 1936, **9**, 672—678).—The influence of frequency of injection, breed of rabbit, and ovariectomy, and the relationship between dose and response were investigated. F. O. H.

**Extraction and spectroscopic detection of œstriol in urine of pregnancy.** H. BIERRY and B. GOUZON (*Compt. rend. Soc. Biol.*, 1937, **124**, 320—323; cf. A., 1936, 644).—The absorption band of œstriol and œstrone occurs at 5735 Å. H. G. R.

**Conjugated œstrogens in urine of pregnant mares.** B. SCHACHTER and G. F. MARRIAN (*Proc. Soc. Exp. Biol. Med.*, 1936, **35**, 222—224).—The "free" œstrogens, as determined colorimetrically, average 0.2—0.5 mg. per 100 c.c. of urine. Combined œstrogens average nearly 10 mg. per 100 c.c. at the 7th month and fall to 1—3 mg. per 100 c.c. at term. Fractionation of a NaOH-washed BuOH extract of urine yields a white amorphous solid containing 40% of œstrogens (as œstrone). Glycuronic acid is not present but the ester contains S and may be a phenol ester of H<sub>2</sub>SO<sub>4</sub>. P. G. M.

**Relation of œstrin and pregnancy urine hormone in influencing uterine motility.** V. J. SAGER and S. L. LEONARD (*Proc. Soc. Exp. Biol. Med.*, 1936, **35**, 242—244).—Œstrin, in sufficient quantity, can override the inhibitory action of pregnancy urine hormone on uterine motility in the castrated rabbit. P. G. M.

**Œstrogenic activities of some synthetic phenanthrene compounds and some oxidation products of theolol.** S. A. THAYER, D. W. MACCORQUODALE, and E. A. DOISY (*J. Pharm. Exp. Ther.*, 1937, **59**, 48—53).—The œstrogenic activity of 32 phenanthrene derivatives is investigated. Of these, 9-ethylphenanthrene, 1-keto-1:2:3:4-tetrahydrophenanthrene, and 2-phenanthrylacetic acid gave positive responses when injected into mice in 25 mg. dose. The oxidation acid C<sub>18</sub>H<sub>22</sub>O<sub>5</sub> of theolol is much less active than theelin but more potent than the above synthetic derivative. P. W. C.

**Oestrogenic action of various products obtained during the refining of petroleum.** A. ARTHUS and M. PROVOOST (Compt. rend. Soc. Biol., 1937, 124, 345—347).—Crude vaseline oils and mazout have oestrogenic properties. This is observed not only after subcutaneous injection but also after complete immersion of the animal in a solution of the product in xylene. H. G. R.

**Action of follicular hormone preparations and follicular hormone on the horse bean (*Vicia faba minor*).** K. A. NEURATH (Biochem. Z., 1937, 289, 201—210).—Administration of small amounts of progynon accelerates shoot formation and larger amounts give small increases in crop yield. P. W. C.

**Chemical nature of  $\delta$ -follicular hormone.**—Sec A., II, 100.

**Presence of a substance similar to prolactin in the urine in essential hypertonia.** E. DICKER (Compt. rend. Soc. Biol., 1937, 124, 303—304). H. G. R.

**Gonadotropic hormone and incoercible vomiting in pregnancy.** A. BRINDEAU, H. HINGLAIS, and M. HINGLAIS (Compt. rend. Soc. Biol., 1937, 124, 349—351).—Hypersecretion of the gonadotropic hormone was observed in cases of vomiting in the early months of pregnancy. H. G. R.

**Action of various substances of the androsterone group on the genital organs of the chicken embryo.** E. WOLFF and E. WOLFF (Compt. rend. Soc. Biol., 1937, 124, 367—369).—17-Methyl-androstan-17-ol-3-one is 4—7 times as active as androsterone (I) in the comb-growth, prostate, and seminal vesicle tests, but only 1.5 times as active on the genital organs of the chicken embryo. Testosterone is 6 times as active as (I) in the comb-growth, 10 times as active on the growth of the seminal vesicles of rodents, but 1.5—2 times less active in the tests on chicken embryos. H. G. R.

**Progesterone-like action of testosterone and certain related compounds.** M. KLEIN and A. S. PARKES (Proc. Roy. Soc., 1937, B, 121, 574—579).—Methyltestosterone and methyl- and ethyl-dihydrotestosterone and -androstanediol produce progestational proliferation in the uterus of ovariectomised rabbits, the activity being approx. 5% of that of progesterone. Testosterone shows some, and androstenedione slight, activity. F. O. H.

**Similarity of action of male hormones and adrenal extracts on the female bitterling.** I. S. KLEINER, A. I. WEISMAN, and D. I. MISHKIND (Science, 1937, 85, 75).—A discussion (cf. this vol., 38). L. S. T.

**Use of bantam capons for the assay of male hormone preparations.** A. S. PARKES (Quart. J. Pharm., 1936, 9, 669—671).—The use of "Old English Game" bantam capons for the comb-test is recommended and a technique for caponisation is described. F. O. H.

**Effect of hormones on blood-sugar in man.** W. SCHULZ (Z. ges. exp. Med., 1935, 97, 343; Chem. Zentr., 1936, i, 2760).—Insulin (I) action was intensified by administration of creatine and Gombreol

(male sexual hormone from testes dissolved in oil). Neither substance alone affected blood-sugar. Pregenyl (a prep. of sexual hormone from urine) had the reverse effect whether administered alone or in conjunction with (I). A. G. P.

**Insulin and the thyroidectomised rabbit.** M. W. GOLDBLATT (J. Physiol., 1936, 86, 46—60).—The hypersensitivity of thyroidectomised rabbits to insulin (I) is due to failure of glycogenolysis at low blood-sugar (II) levels. Unless the animals have been starved sufficient glucose is liberated to prevent convulsions. The hypersensitivity is not further increased by ergotamine. Adrenalinæmia in both normal and thyroidectomised adult rabbits is increased during hypoglycæmia. The (II) and blood-lactic acid increases caused by adrenaline in the thyroidectomised animal are slower in onset than in the normal animal; the (II) increase is also less in degree. The failure of glycogenolysis is hence due to the sluggishness of response of the sympathetic mechanism causing it; (I) does not produce deposition of glycogen in the livers of young thyroidectomised rabbits. R. N. C.

**Insulin and the storage of liver-glycogen in anaesthetised cats.** C. REID (J. Physiol., 1936, 87, 121—128).—Slow infusion of insulin (I) in fasting normal and adreno-medullectomised cats causes a rise of liver-glycogen (II) during the experimental period if the (I) does or the initial glucose (III) level in the blood is high, and a fall if the (I) dose is low and the initial blood-(III) is normal. (II) falls in both series of animals soon after (I) infusion is stopped, whilst blood-(III) rises in the normal animals only. (II) deposition in the normal animal given (III) is not increased by additional (I). The decrease of  $\text{SO}_4^{--}$  excretion produced by (III) is abolished by pancreatectomy, but is restored by (I) if the initial blood-(III) is high. (II) storage during infusion of (III) is not affected by pancreatectomy. R. N. C.

**Action of insulin-glucose chloride on post-operative acidosis.** O. LAMBRET, J. DRIESSENS, and H. MALATRAY (Compt. rend. Soc. Biol., 1937, 124, 685—686; cf. A., 1936, 1565).—The acidosis is rapidly reduced by injection of a hypertonic solution of  $\text{Cl}^-$  and glucose associated with insulin. H. G. R.

**Changes in the tissue of the adrenal cortex in rabbits following chronic insulin treatment.** F. SCHENK and H. LANGECKER (Endokrinol., 1935, 16, 305—311; Chem. Zentr., 1936, i, 1901—1902).—Repeated subcutaneous injection of insulin into sexually-mature male rabbits increases the development of the cortex in which lipin-rich cells predominate. Subsequently three definite layers are formed, the inner- and outer-most of which contain plasmarich cells of low lipin content. A. G. P.

**Increase of adrenaline in the adrenal venous blood after injection of insulin.** J. LA BARRE and R. SARIC (Compt. rend. Soc. Biol., 1937, 124, 287—289).—Stimulation of the central nervous system is the cause of adrenaline secretion following insulin administration. H. G. R.

**Action of protamine-insulin in rabbits in relation to its standardisation.** R. P. PATEL and B. RONNMARK (Quart. J. Pharm., 1936, 9, 679—683).—Subcutaneous injection into rabbits of small doses (approx. 0.5 unit per kg.) of "neutralised" protamine-insulin has an effect on the blood-sugar almost identical with that of the same dose of a normal insulin prep. F. O. H.

**Factors influencing the stability of insulin.** M. SAHYUN, M. GOODELL, and A. NIXON (J. Biol. Chem., 1937, 117, 685—691).—An insulin (I) solution (100 units per c.c.;  $p_H$  approx. 3) on incubation at 52° lost 17% of its potency in 1 week and 50% in 9 weeks. After addition of 1 mg. of Cu or Fe per 1000 units, the loss was smaller; with 1 mg. of Zn (which does not affect the hypoglycaemic action in rabbits), the loss was negligible after 7 weeks and only amounted to 10% after 9 weeks. P. W. C.

**Factors antagonising the thyroxine influence on differentiation.** O. HOFFMAN (Cold Spring Harbor Symp., 1934, 2, 106—109).—In amphibian larvae  $NH_2$ -acids (especially arginine) delayed the differentiation caused by di-iodotyrosine. Ornithine antagonised thyroxine (I). Urea dehydrated tissues but accelerated (I) differentiation. The latter was also accelerated by glucose, glycogen, xylose, and (sometimes) fructose but retarded by galactose, sucrose, and (usually) lactose. Adrenaline mobilised blood-sugar and (I) increased its destruction. Hence adrenaline hastened and insulin retarded the response to (I). The antagonistic action between MeCN and (I) is not a species-limited reaction. CH. ABS. (p)

**Immunology of the thyroid problem.** I. SNAPPER and A. GRUNBAUM (Wien. klin. Woch., 1935, 48, 1199—1201; Chem. Zentr., 1936, i, 1902—1903).—Pptn. of iodoprotein (I) by anti-(I) sera is inhibited by very small amounts of di-iodotyrosine (II). Sera obtained after injection of thyreoglobulin (III) do not ppt. (I). Pptn. of (III), elityran, or thyroid extract by anti-(III) sera is not inhibited by addition of thyroxine (IV). (II) and (IV) probably are not combined with protein in the thyroid. Pptn. of (I) by anti-(I) sera is inhibited by (II) and other compounds containing the 2:6-di-iodophenol group. A. G. P.

**Effect of antithyrotropic serum on the thyroid gland of guinea-pigs treated with thyrotropic hormone.** E. F. SCOWEN and A. W. SPENCE (J. Physiol., 1936, 86, 109—116).—Rabbits injected with thyrotropic hormone develop in their serum an antithyrotropic substance (I) that is also present in traces in normal rabbit and human serum, but not in serum from patients with Graves' disease. (I) is probably a hormone rather than an antibody. R. N. C.

**Influence of the pineal body on growth.** L. TAKACS (Z. ges. exp. Med., 1935, 97, 204—206; Chem. Zentr., 1936, i, 2129—2130).—Administration of powdered pineal gland improves the growth and body-wt. of young pullets. A. G. P.

**Functional relation between pineal body and anterior pituitary. I. Effect on ketonæmia.** S. FIANDACA (Biochem. Therap. Sperim., 1935, 22,

9—17; Chem. Zentr., 1936, i, 2128).—Injection of anterior pituitary extracts into rabbits increased the proportion of ketonic substances, notably  $\beta$ -hydroxybutyric acid, in blood. Pineal extracts have the reverse effect and when injected simultaneously prevent the above action of pituitary extracts. A. G. P.

**Liberation of histamine by the heart muscle.** G. V. ANREP, G. L. BARSOUM, and M. TALAAT (J. Physiol., 1936, 86, 431—451).—The cardiac muscle continuously produces measurable quantities of a histamine-like substance (I) which is probably histamine itself. (I) production is decreased when the heart fails, and is increased by a high arterial resistance, adrenaline, anoxæmia, and  $CO_2$  administration. The heart rate and the systemic output do not affect (I) production. R. N. C.

**Chemical transmitter of motor impulses to the stomach.** J. S. HARRISON and B. A. McSWINEY (J. Physiol., 1936, 87, 79—86). R. N. C.

**Action of the nephrohormone in regulating the water content of blood.** K. ISHIDA and T. MIYAJI (J. Chosen Med. Assoc., 1935, 24, 471—488).—The kidney produces a hormone which controls blood- $H_2O$ . Experimental hydræmia is inhibited by injection of renal venous blood. The hormone is insol. in  $H_2O$  but sol. in EtOH,  $Et_2O$ ,  $Ac_2O$ , and  $CHCl_3$ , is unsaponifiable, and resistant to heat and strong alkali. CH. ABS. (p)

**Dihydroxyphenylethanolamine (arterenol) as a possible sympathetic hormone.** R. L. STEHLE and H. C. ELLSWORTH (J. Pharm. Exp. Ther., 1937, 59, 114—121).—The effect of arterenol (I) on the blood pressure of ergotaminised decapitate cats is often though not invariably similar to the effect obtained on stimulation of the hepatic sympathetic nerves, and it is suggested that (I) is possibly liberated *in vivo* on such stimulation. P. W. C.

**Avitaminosis in young beasts of prey.** A. SCHEUNERT and F. SCHMIDT-HOENSDORF (Zool. Garten, 1936, 8, 113—116; Chem. Zentr., 1936, i, 2766).—Avitaminosis- $B_1$ , -A, and -D are demonstrated. A. G. P.

**Nutritive value of yeast as a supplementary substance in the diet of infants.** I. K. ITAMI (Okayama-Igak.-Zasshi, 1935, 47, 2072—2096).—The vitamin-A, -B, -C, and -D contents of various yeast preps. are examined. CH. ABS. (p)

**Avitaminosis-A and nitrogen metabolism.** L. EMERIQUE (Compt. rend. 1936, 203, 1546—1548; cf. A. 1935, 1034).—During -A deficiency in the rat, the amount of N fixed decreases, urinary N increases, and faecal N is approx. const. In avitaminosis-A there is a breakdown in the synthesis of sp. proteins, with an increase in N metabolism. J. N. A.

**Comparative influence of sugars in avitaminosis-A and on an artificially-complete diet on the growth and recovery of the rat.** L. RANDOIN and S. QUEVILLE (Bull. Soc. Chim. biol., 1936, 18, 1789—1802).—Utilisation of galactose and lactose is not favoured by the presence of vitamin-A or -B. Glucose, fructose (I), maltose, and sucrose have practically no effect on the development of avit-

aminosis-*A* (time of cessation of growth, and appearance of xerophthalmia, rapidity of loss of wt., length of survival). Of the latter sugars (I) has the most unfavourable effect in respect of maintenance of the general condition of rats. P. W. C.

**Crystalline vitamin-*A* concentrate.** H. N. HOLMES and R. E. CORBET (Science, 1937, 85, 103).—Fractionation by freezing of a solution of the non-saponifiable matter from the liver oil of *Stereolepis ishinagi* yields a cryst. product of blue val. 10<sup>5</sup>, m.p. 5.5–6°, I val. 360, corresponding with 4 double linkings. Preliminary analyses indicate C 83.5, H 10.5% approx. L. S. T.

**Vitamin-*A* content of Australasian fish liver-oils.** I. W. DAVIES and D. J. FIELD (Biochem. J., 1937, 31, 248–250).—A table summarises the vitamin-*A* contents, determined by non-biological methods, of the liver-oils of nine species of fish. All species (except one) give average vals. of >0.1%, and an increase occurs in early summer. Only one (school shark, *Galeorhinus australis*) appears to be of economic importance. P. W. C.

**Carotene of milk-fat (butter).** A. E. GILLAM and M. S. EL RIDI (Biochem. J., 1937, 31, 251–253).—Pure carotene (I), m.p. 180–181°, absorption max. in CS<sub>2</sub> 514, 482 mμ, was isolated from a mixed sample of colostrum and ordinary milk-fat and shown to be practically pure β-(I), α-(I) being either absent or present in amounts <0.3% of the total (I). P. W. C.

**Discrepancy between biological assays and other methods of determining vitamin-*A*.** II. H. PRITCHARD, H. WILKINSON, J. R. EDISBURY, and R. A. MORTON (Biochem. J., 1937, 31, 258–265).—Various vitamin-*A*-rich concentrates are separated by extraction with aq. 83% EtOH into sol. fractions, the physical and chemical criteria of which correspond closely with those usually accepted for -*A*, and insol. fractions which possess much greater biological activity than would be anticipated from the “blue” vals., and exhibit an absorption max. at 285–290 mμ, often without an inflexion at 328 mμ. One of the latter fractions, from a mammalian liver-oil concentrate, contained no detectable -*A* but was biologically active (17,900 international units per g.). Similar but less striking fractions were obtained by chromatographic adsorption. P. W. C.

**Evaluation of fish-liver oils.**—See B., 1937, 258.

**Vitamin-*B* group.** E. DANE (Chem.-Ztg., 1937, 61, 145–148).—A review.

**Influence of avitaminosis-*B* on the composition of pigeon muscle.** R. DUFFAU (Compt. rend., 1937, 204, 192–195).—A vitaminosis-*B* lowers the proportions of reducing sugars, lactic acid, orthophosphates, and total acid-sol. P in pigeon muscle. Daily administration of 2 g. of yeast prevents all derangement of muscle metabolism. Dosages of 1 g. prevent symptoms of avitaminosis but muscle composition is characteristic of the avitaminotic condition. A. G. P.

**Influence of vitamin deficiency on [after-effects of] surgical operations in south China.** K. BOSHAMER (Münch. med. Woch., 1935, 82, 2045–

2047; Chem. Zentr., 1936, i, 2132–2133).—Deficiency of vitamin-*B*<sub>1</sub> affects post-operative changes; that of -*A* influences subsequent infections during healing. The significance of deficiencies as the causes of various diseases is also considered. A. G. P.

**Effect of oryzotoxin on the growth of pigeons.** G. SOLARINO (Boll. Soc. ital. Biol. speriment., 1935, 10, 917–920; Chem. Zentr., 1936, i, 2133).—Oryzotoxin (I) occurs in the EtOH extract of polished rice. Effects of feeding an aq. emulsion of (I) on the beri-beri quotient of growing pigeons are examined. A. G. P.

**Synthetic vitamin-*B*<sub>1</sub>.** R. R. WILLIAMS and J. K. CLINE (J. Amer. Chem. Soc., 1937, 59, 216–217).—Synthetic vitamin-*B*<sub>1</sub> chloride (A., 1936, 1276) is obtained with m.p. 232–234° from MeOH + Et<sub>2</sub>O, and with m.p. 246–250° from MeOH + EtOH or H<sub>2</sub>O + EtOH. The bromide behaves similarly. Both forms have the same absorption spectra and physiological activities. H. B.

**Colorimetric determination of vitamin-*B*<sub>1</sub>.** I. PANSCHINA-TRUFANOVA (Biochimia, 1936, 1, 597–602).—1 ml. of Ehrlich's diazo-reagent and 0.5 ml. of Kinnerley and Peters' buffer solution (A., 1934, 705) are added to 0.1 ml. of solution, followed by 0.06 ml. of N-H<sub>2</sub>SO<sub>4</sub>. The red coloration is completely developed in 1 min., and remains unchanged for <15 days. R. T.

**Rates of digestion and absorption in avitaminosis-*B*<sub>1</sub> and -*B*<sub>2</sub>.** R. REDER and W. D. GALLUP (Proc. Oklahoma Acad. Sci., 1935, 15, 58–61).—Rates of digestion and absorption of carbohydrates by rats; deprived of vitamin-*B*<sub>1</sub> and -*B*<sub>2</sub> were < normal. Addition of -*B*<sub>1</sub> to the diet did not increase the rates; that of -*B*<sub>2</sub> induced the same rates as when both vitamins were supplied.

CH. ABS. (p)

**Preparation of pure vitamin-*B*<sub>1</sub> and -*B*<sub>2</sub> (flavin), together with ergosterol, from yeast.** A. V. TRUFANOV (Biochimia, 1936, 1, 498–511).—The fresh yeast is boiled for 10 min. with an equal vol. of 0.1% AcOH, in presence of 0.1% of PhMe, the suspension is centrifuged, and the supernatant liquid is evaporated at 35–40° to 20% of its original vol. It is then deproteinised [144 ml. of Pb(OAc)<sub>2</sub> per litre of solution], filtered, and the warm filtrate is treated with 150 ml. of 25% Ba(OH)<sub>2</sub> suspension per litre. Vitamin-*B*<sub>1</sub> is absorbed from the filtrate from this operation, using finely powdered birch C activated by boiling with HCl; 50% of the original -*B*<sub>1</sub> content is recovered by acid elution of the adsorbate. Practically the entire ergosterol (I) of the yeast remains in the centrifugate after extraction. Flavin is recovered from the Pb(OAc)<sub>2</sub> ppt. by boiling for 1.5 hr. with 7% H<sub>2</sub>SO<sub>4</sub>, filtering, and absorbing on ascanite, from which it is eluted by C<sub>5</sub>H<sub>5</sub>N-MeOH-AcOH-H<sub>2</sub>O mixture. The yields of cryst. products were: 0.9 mg., -*B*<sub>2</sub> 0.22 mg., and (I) 4 g. per kg. of yeast. R. T.

**Semiquinone of the flavine dyes, including vitamin-*B*<sub>2</sub>.**—See A., 1936, 1392.

**Distinction between the antiscorbutic and antidystrophic activities of ascorbic acid in experimental scurvy.** G. MOURIQUAND, H. TETE,

and G. WENGER (Compt. rend. Soc. Biol., 1937, 124, 659—661).—Complete absence of ascorbic acid from the diet produces a general dystrophy, whilst with a partial deficiency, hæmorrhagic lesions without dystrophy occur.  
H. G. R.

**Antiscorbutic power of complex salts derived from vitamin-C (sodium ferri- and ferro-scorbon).** G. MOURQUAND, F. ARLOING, A. MOREL, A. JOSSERAND, and S. ARMAND (Compt. rend. Soc. Biol., 1937, 124, 661—664).—The preventive doses of Na ferriscorbon (I) and ferrosorbon (A., 1935, 1526) are 5 and 1.5 times that of *l*-ascorbic acid, respectively, at this dosage (I) having an antidystrophic action.  
H. G. R.

**Antiscorbutic action of monomethylvitamin-C.** N. BEZSSONOFF and R. SACREZ (Compt. rend. Soc. Biol., 1937, 124, 356—358).—The activity of 3-methylascorbic acid is < that of the cryst. substance isolated from cabbage juice (A., 1925, I, 751).  
H. G. R.

***l*-Ascorbic acid and cholesterol metabolism.** R. TISLOWITZ (Z. ges. exp. Med., 1935, 97, 127—133; Chem. Zentr., 1936, i, 1908).—Brief or prolonged administration of ascorbic acid to dogs did not change the blood-cholesterol level. In respect of cholesterol metabolism vitamin-*B*<sub>1</sub> and -*C* are antagonistic to -*A* and -*D*.  
A. G. P.

**Influence of ascorbic acid on melanogen elimination.** H. KAHLER and V. LA CROIX (Klin. Woch., 1935, 14, 1851—1853; Chem. Zentr., 1936, i, 2133).—Melanogen production in red cells is inhibited by vitamin-*C*.  
A. G. P.

**Effect of vitamin-C on the pathologically modified blood picture [leucocythæmia].** H. EUFINGER and G. GAERTGENS (Klin. Woch., 1936, 15, 150—151; Chem. Zentr., 1936, i, 2133).—The action of vitamin-*C* is centred on the bone marrow.  
A. G. P.

**Ascorbic acid in lactating women.** F. WIDENBAUER and A. KUHNER (Z. Vitaminforsch., 1937, 6, 50—75).—Examination of the vitamin-*C* metabolism in six lactating women indicated a -*C* deficiency, the content in -*C* of the milk of 0.0005—0.0022% being equiv. to a deficiency of 1.5—5.7 g. in the maternal organism. Administration of -*C* produced a level of 0.0038—0.0075% in the milk. When saturation in -*C* of the maternal organism occurs, urinary excretion is initiated and the -*C* content of the milk increases to an extent > that of the urine. The daily requirement of the mother is 80—100 mg. of -*C* in order that the suckling receives 40—50 mg. per day. Oral administration of -*C* increases erythrocyte, thrombocyte, and reticulocyte counts, hæmoglobin val., and blood coagulability lowered by avitaminosis-*C*; the leucocyte picture is also corr.  
F. O. H.

**Metabolism of vitamin-C.** T. BAUMANN and L. RAPFOLT (Z. Vitaminforsch., 1937, 6, 1—50).—Methods of determining vitamin-*C* in urine and milk were investigated. In lactating women, the min. requirement of -*C* is 50 mg. per day; when the milk contains <0.004% of -*C*, the maternal organism is being depleted. The -*C* content of milk depends on that of the maternal organism and ultimately on that

of the diet and amount of milk secreted. Generally the content in milk during spring is < that during summer and autumn. Prolonged accumulation of -*C* in the maternal organism is possible. With infants breast-fed on milk containing 0.0009—0.0015% of -*C*, avitaminosis-*C* was not evident. With infants receiving up to 100 mg. of -*C* per day, the urinary excretion of -*C* per kg. body-wt. at very high intakes is relatively < that at lower intakes. Other metabolic aspects of -*C* in normal and diseased children are discussed.  
F. O. H.

**Vitamin-C metabolism of the new-born.** W. NEUWEILER (Z. Vitaminforsch., 1937, 6, 75—82).—In infants aged 9—10 days, the excretion and saturation vals. of vitamin-*C* differed with the amount of -*C* received (*i.e.*, with breast- or artificial feeding). The -*C* requirement for the suckling is approx. 6 mg. per kg. daily, synthesis of -*C* not occurring in the organism.  
F. O. H.

**Vitamin-C content of cow's milk.** S. K. KON and M. B. WATSON (Biochem. J., 1937, 31, 223—226).—The healthy mammary gland secretes -*C* only in the reduced form. Under South of England conditions the -*C* content of herd milk is unaffected by season or nutrition. The -*C* content of colostrum is only slightly > that of milk. Milk from a cow suffering from mastitis is much poorer in -*C*.  
J. N. A.

**Vitamin-C in normal and parodontotic human saliva.** D. ZIMMET and H. DUBOIS-FERRIERE (Arch. Sci. phys. nat., 1936, 18, Suppl., 151—154).—The saliva of humans free from dental or mouth diseases contains about 0.0014% of ascorbic acid (I) (*cf.* Stuteville, A., 1936, 906). This val. does not vary with the time of day, and is unaffected by administration of (I). 50% lower vals. are found in patients with parodontosis; treatment with (I) effects clinical improvement.  
F. A. A.

**Effect of tonsilectomy on the vitamin-C content of human saliva.** D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1937, 124, 246—247).—A marked decrease in the concn. of vitamin-*C* was observed.  
H. G. R.

**Vitamin-C and reduced glutathione in the human tonsils.** D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1937, 124, 247—248).—The tonsils contain 0.02—0.025% of vitamin-*C* and 0.104—0.109 and 0.155—0.170% of reduced glutathione by Randoin and Fabre's and Zimmet's methods, respectively.  
H. G. R.

**Diuretic action of vitamin-C.** M. A. ABBASY (Biochem. J., 1937, 31, 339—342).—An increase in urine elimination was regularly observed when large doses of -*C* were administered to rheumatic and normal children.  
R. M. M. O.

**Synthesis of vitamin-C by orthoptera (*Blattella germanica*) grown aseptically.** E. WOLLMAN, A. GIROUD, and R. RATSIMAMANGA (Compt. rend. Soc. Biol., 1937, 124, 434—435).—The insects, grown aseptically over a period of 15 years on a vitamin-*C*-free diet, contain 0.01—0.02% of -*C*.  
H. G. R.

**Biological rôle of vitamin-C in the plant.** B. A. RUBIN and K. STRATSCHITZKI (Biochimia,

1936, 1, 343—350).—Vitamin-C is absent in cabbage seed, but appears before the 4th day of germination. Along with catalase (II) and peroxidase (III) it continues to increase and reaches max. concn. when the plant has 8 leaves. The -C content then decreases, whilst those of (I) and (II) steadily increase until the period of ripening, when the -C and (I) activities fall; that of (II) continues to increase. W. O. K.

**Vitamin-C in tea.** I. A. GOLJANIZKI and K. A. BRJUSCHKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1936, 4, 381—384).—Fermentation of Russian tea leaves (containing 0.113—0.187% of vitamin-C) activates the inactive -C content. F. N. W.

**Biological assay of the vitamin-C content of Swedish apples.** G. F. GOTHLIN (Kung. Landtbruks.-Akad. Handl., 1935, 74, 884—962; Chem. Zentr., 1936, i, 2384).—Data for 12 varieties are recorded. Highest vals. occurred in Bramley's Seedling. A. G. P.

**Enzymic action of ascorbic acid (vitamin-C).** G. WOKER and J. ANTENER (Helv. Chim. Acta., 1937, 20, 144—150).—Preliminary experiments show no difference in the behaviour towards  $\text{CH}_2\text{O}$ -methylene blue (I) solution of crude boiled milk and that treated with ascorbic acid (II). (II) appears identical with the Schardinger enzyme of crude milk. In place of (I), S can function as acceptor. Peroxidase action of (II) is established, as is the diastatic action of the system (II)-dehydroascorbic acid. H. W.

**Interaction of peroxidase and ascorbic acid in biological oxidations and reductions.** H. TAUBER (Enzymologia, 1936, 1, 209—212).—Ascorbic acid is rapidly oxidised by peroxidase if quinone-forming substances are present. Oxidation is especially rapid in the presence of adrenal extracts, which contain an unknown substance much more powerfully phenolic than adrenaline. E. A. H. R.

**Dehydroascorbic acid reductase.** E. F. KOHMAN and N. H. SANBORN (Ind. Eng. Chem., 1937, 29, 189—190).—If 2 : 6-dichlorophenol-indophenol (I) can be used to determine ascorbic acid, raw pea juice, but not the heated juice nor raw cabbage juice, contains a dehydroascorbic acid reductase, since in raw pea juice restoration of reducing val. towards (I) appears to be possible after its destruction by oxidation. I. A. P.

**Autoxidation and inorganic catalysis and the activity of the ascorbic acid oxidase.** J. ETTORI and R. GRANGAUD (Compt. rend. Soc. Biol., 1937, 124, 557—559).—Traces of Cu markedly increase the autoxidation of ascorbic acid at  $p_{\text{H}}$  6.15. H. G. R.

**Peculiarities of oxidation of vitamin-C.** N. A. BEZSSONOFF [with M. I. WOLOSZYN] (Biochimia, 1936, 1, 548—559).—The proportion of ascorbic acid (I) oxidised by atm.  $\text{O}_2$  at 37° is inversely  $\propto$  initial concn. of (I). The reaction involves formation of ascorbic ether (II),  $(\text{C}_6\text{H}_7\text{O}_6)_2$ . The resulting equilibrium is represented : (I)  $\rightleftharpoons$  (II) dehydroascorbic acid (III). This equilibrium exists in lemon juice in presence of dichlorophenol-indophenol (IV), which oxidises  $>40\%$  of the (I) present. In solutions of pure (I), (IV) completely oxidises (I), to give the equilibrium (II)  $\rightleftharpoons$  (III), as is shown by the negative

L (A., III.)

Bezssonoff reaction and by biological tests. The reaction of decoloration of (IV) by (I) in lemon juice is less sensitive to variations in  $p_{\text{H}}$  than is the case with solutions of pure (I). It is concluded that in biological media (I) can take part in redox reactions involving free  $\text{O}_2$ , taking place at cell membranes. R. T.

**Reduction of dehydroascorbic acid by lactic acid bacteria.** E. S. TKATSCHENKO (Biochimia, 1936, 1, 579—582).—Conversion of dehydroascorbic acid into ascorbic acid takes place in cultures of *B. bulgaricus*, *acidophilus*, and *Leichmanni*. R. T.

**True vitamin-C content of the animal organism.** P. E. SIMOLA and E. YLINEN (Suomen Kem., 1937, 10, B, 1).—Ascorbic acid is the only substance present in brain, kidney, thymus, thyroid, and intestine which reduces dichlorophenol-indophenol. Liver and adrenal extracts contain in addition small quantities of other reducing substances.

E. A. H. R.

**Determination of reduced ascorbic acid in blood.** M. PIJOAN, S. R. TOWNSEND, and A. WILSON (Proc. Soc. Exp. Biol. Med., 1936, 35, 224—226).—Determination in blood should be carried out within  $\frac{1}{2}$  hr. of collection, since the vals. are affected by storage even at 0°.

P. G. M.

**Spectrophotometric determination of ascorbic acid in tissues.** A. CHEVALLIER and Y. CHORON (Compt. rend. Soc. Biol., 1937, 124, 453—455).—Results obtained by measurement of the absorption band at 2650 Å. are  $<$  those obtained by chemical methods. H. G. R.

**Determination of vitamin-C.** N. BEZSSONOFF and V. WOLOSZYN (Compt. rend. Soc. Biol., 1937, 124, 353—355).—Details are given of Bezssonoff's method (A., 1934, 1145). H. G. R.

**Potentiometric determination of vitamin-C.** E. BECKER and J. DI GLERIA (Z. Vitaminforsch., 1937, 6, 86—95).—Pure vitamin-C preps. can be determined by I (which gives the higher vals.) or 2 : 6-dichlorophenol-indophenol. In neutral or slightly acid media ( $p_{\text{H}} > 4$ ), -C is not stable. The oxidation-reduction potential of -C against a saturated  $\text{Hg}_2\text{Cl}_2$  electrode is +329.5 mv. at  $p_{\text{H}}$  0, the val. decreasing by approx. 58 mv. for each increase in  $p_{\text{H}}$  of 1.0. Determination of -C in foods by potentiometric titration is described. F. O. H.

**Precipitation and colour reaction for ascorbic acid. Specificity of acidified sodium selenite solution.** V. E. LEVINE (Proc. Soc. Exp. Biol. Med., 1936, 35, 231—235).—Ascorbic acid is the only org. substance tested which reduces acidified selenite reagent to Se in the cold. P. G. M.

**Ascorbic acid in the cell and its detection.** A. GIROUD, C. P. LEBLOND, R. RATSIMAMANGA, and M. RABINOWICZ (Protoplasma, 1936, 25, 115—123).—Bibliographical review. M. A. B.

**New forms and sources of vitamin-D.** C. E. BILLS (J. Amer. Med. Assoc., 1937, 108, 13—15).—A review.

**Photochemical transformation of ergosterol into vitamin-D.** O. F. F. NICOLA (Rev. méd. Lat.-Amer., 1934, No. 220, 358—385; No. 231, 479—

510).—The transformation is influenced by the quality and purity of the solvents used, but is governed by the laws of photochemistry. Irradiation with  $\lambda\lambda$  300—284 m $\mu$  yields largest amounts of vitamin-*D*. At other  $\lambda\lambda$  other substances without antirachitic potency are produced. Prolonged irradiation destroys -*D*.  
CH. ABS. (p)

**Effect of solvents on therapeutic activity of irradiated ergosterol.** F. ERBEN (Münch. med. Woch., 1935, **82**, 1794—1795; Chem. Zentr., 1936, i, 2134).—Cryst. vitamin-*D* dissolved in propylene glycol (I) (0.03 g. per 100 c.c.) shows increased chemical activity. Irradiated ergosterol under these conditions is 2—3 times as active as when dissolved in oil. (I) is non-toxic.  
A. G. P.

**Relation of bile to absorption of vitamin-*D*.** N. B. TAYLOR, C. B. WELD, and J. F. SYKES (Brit. J. Exp. Path., 1935, **16**, 302—309).—Bile is necessary for the absorption of irradiated ergosterol from the intestinal tract. Only a small fraction of the vitamin-*D* administered orally or intravenously appears in the bile of dogs. Bile given to chicks does not enhance the antirachitic action of -*D*.  
CH. ABS. (p)

**Mode of action of vitamin-*D*. IV. Absorption of calcium chloride, xylose, and sodium sulphate from isolated loops of small intestine and of calcium chloride from the abdominal cavity of the rat.** R. NICOLAYSEN (Biochem. J., 1937, **31**, 323—328; cf. this vol., 104).—The amount of injected CaCl<sub>2</sub> absorbed from loops isolated under physiological conditions during 5 hr. increases smoothly with increase in the amount injected, but is always less in vitamin-*D* deficiency. The latter has no effect on absorption of xylose or Na<sub>2</sub>SO<sub>4</sub> or of CaCl<sub>2</sub> from the abdominal cavity, whence it is inferred that the action of -*D* is local and sp. The lower rate of Ca absorption as compared with that for other substances and the lower acidity of the intestinal contents in -*D* deficiency suggests that -*D* effects increased secretion of Ca into the intestine.  
R. M. M. O.

**Influence of large doses of vitamin-*D* on composition of eggs.** C. ANTONIANI and F. USUELLI (Biochim. Terap. sperim., 1935, **22**, 1—8; Chem. Zentr., 1936, i, 2133—2134).—Administration of large doses of vitamin-*D* to hens caused a slight decrease in egg-wt. but did not affect wt. of yolk or shell or the Ca and P contents of the latter.  
A. G. P.

**Influence of vitamin-*D* on activity of phosphatase.** G. RATH (Diss., Kiel, 1933: Bied. Zentr., 1935, A, **6**, 182).—Phosphatemia curves of rabbits indicate inhibition of phosphatase activity following administration of vitamin-*D*.  
A. G. P.

**Chemical activation of sterols. II. Activation of cholesterol and its derivatives.** J. C. ECK, B. H. THOMAS, and L. YODER (J. Biol. Chem., 1937, **117**, 655—661).—Cholesterol (ordinary and purified), cholesteryl chloride, cholesterylene, dicholesteryl ether, cholestene, and Bu cholesteryl ether are all activated by heating at 85—90° with H<sub>2</sub>SO<sub>4</sub>-Ac<sub>2</sub>O in AcOH, yielding a product (I) of the same antirachitic potency, whilst only ordinary

cholesterol yields a potent antirachitic substance on irradiation. This proves that (I) is not derived from the provitamin-*D* of cholesterol.  
P. G. M.

**Pro-vitamin from the sterol of pigskin.** A. WINDAUS and F. BOCK (Z. physiol. Chem., 1937, **245**, 168—170).—The pro-vitamin (I) content of the skin is that of internal organs. Pigskin, which contains up to 5.9% of (I), is the richest source of (I) yet encountered. (I) isolated from the crude sterols of the skin by adsorption on Al<sub>2</sub>O<sub>3</sub> and fractional elution is identical with 7-dehydrocholesterol.  
W. McC.

**Antirachitic vitamin from halibut-liver oil.** H. BROCKMANN (Z. physiol. Chem., 1937, **245**, 96—102; cf. A., 1936, 1162).—The antirachitic vitamin of the oil, isolated as 3:5-dinitrobenzoate by the procedure formerly described, is -*D*<sub>3</sub>. No other antirachitic vitamin could be obtained from the oil.  
W. McC.

**Vitamin-*D* in tunny-liver oil.** S. SCHMIDT-NIELSEN and S. SCHMIDT-NIELSEN (Norske Vid. Selsk., 1933, **6**, 218—221; Bied. Zentr., 1935, A, **6**, 181).—Oil is extracted from Na<sub>2</sub>SO<sub>4</sub>-dried liver by means of CHCl<sub>3</sub>. Vitamin-*D* contents average 50,000—100,000 Oslo units, but vals. decline rapidly during storage for 1 year.  
A. G. P.

**Antirachitic substance from tunny-liver oil.**—See A., II, 100.

**Antirachitic potency of vitamin-*D*.**—See B., 1937, 287.

**Effects of vitamin-*E* deficiency on the thyroid gland of the rat.** E. SINGER (J. Physiol., 1936, **87**, 287—290).  
R. N. C.

**Gonadotropic activity of the pituitaries of vitamin-*E*-deficient rats.** I. W. ROWLANDS and E. SINGER (J. Physiol., 1936, **86**, 323—326).—The luteinising capacity of the pituitary of the non-pregnant rat is reduced in avitaminosis-*E*, and a similar condition occurs in early pregnancy. The gonadotropic hormone content of the pituitaries of rats that have been cured of avitaminosis-*E* is normal.  
R. N. C.

**Antihaemorrhagic vitamin.** H. J. ALMQUIST (J. Biol. Chem., 1937, **117**, 517—523).—The highly active oil, N 0.23%, no S or P, obtained by mol. distillation (A., 1936, 1431) contains no ·OH and is optically inactive. It is unstable to EtOH-alkalis, and is destroyed by sunlight, absorbing strongly in the ultra-violet. The concentrate has mean mol. wt. 600, and gives positive tests for indole and unsaturated linkings.  
F. A. A.

**Treatment of human pellagra with the "filtrate factor."** P. J. FOUTS, S. LEFKOVSKY, O. M. HELMER, and T. H. JUKES (Proc. Soc. Exp. Biol. Med., 1936, **35**, 245—247).—Human pellagra can be cured in patients on a maize diet by a liver filtrate (containing the chick antidermatitis factor) free from vitamin-B<sub>2</sub> and -B<sub>6</sub>.  
P. G. M.

**Dietary requirements for lactation. VI. Further experiments on factor L<sub>2</sub>, a second lactation factor present in yeast.** W. NAKAHARA, F. INUKAI, and S. UGAMI (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **31**, 42—54; cf. A., 1936, 766).—

Factor  $L_2$  is extracted from yeast by EtOH, carried down with the phosphotungstic acid ppt. and again with the  $\text{AgNO}_3$  ppt. A. L.

**Advances in the colloid chemistry of protoplasm in the last ten years. I—III.** V. V. LEPESCHKIN (*Protoplasma*, 1935, 24, 470—494; 1936, 25, 124—149, 301—332).—A review.

M. A. B.  
**Development and adaptation of plastids.** R. SAVELLI (*Atti R. Accad. Lincei*, 1936, [vi], 24, 156—159).—The nature and evolution of "eleo-chloroplastids" from normal plastids in plants such as xerophytes are discussed. F. O. H.

**Action of X-rays on the cell elements of spring wheat.** A. S. AFANASSIEVA (*Protoplasma*, 1936, 25, 77—91).—Doses up to 1000  $r$  had no effect on wheat in contrast to rye. Higher doses produced adverse effects as in rye, including the appearance of chromatin masses in the cell plasma. M. A. B.

**Action of  $\alpha$ -rays on protoplasm and chloroplasts.** R. BREBL (*Protoplasma*, 1935, 24, 225—257).—Exposure of *Bryum* leaves to Po preps. varying from 0.8 to 17.2 mg. Ra equiv. caused characteristic injury or death of cells. The lethal time of exposure varied inversely with the strength of the prep. During the latent period between cessation of irradiation and death, the chloroplasts became smaller and rounded and the cells showed changes in type and rate of plasmolysis by KCl, urea,  $\text{CaCl}_2$ , and fructose. Plasma- $\gamma$  was increased. M. A. B.

**Action of X-rays on dormant and germinating seeds.** A. J. ATABEKOVA (*Protoplasma*, 1936, 25, 234—260).—Doses of 250  $r$  hastened germination of pea seeds by 2—3 days and increased germinating power by 24.5%. Similar treatment of seedlings increased resistance to adverse conditions, rate and uniformity of ripening, and yield (by 12%).

M. A. B.  
**Influence of mitogenetic radiation on cell permeability.** A. POTOZKY (*Protoplasma*, 1936, 25, 49—55).—Mitogenetic radiations produced by the interaction of  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{FeSO}_4$  or  $\text{H}_2\text{O}_2$  and  $\text{KMnO}_4$  increased the permeability of the cells of beetroot and flower petals as shown by diffusion of cell sap and pigment into the intercellular spaces or the surrounding medium and by fading of the petals.

M. A. B.  
[Plant] cell elongation; electrical properties of the cell wall. J. BONNER and A. N. J. HEYN (*Protoplasma*, 1935, 24, 466—469).—The cataphoretic charge of suspensions of cell wall particles of *Avena* coleoptiles appears to depend not on pectins, cellulose, hemicelluloses, or phosphatides but on certain proteins which are very firmly bound to the cell wall and are not removable even by heating with HCl or NaOH. The charge is unaltered by additions of hetero-auxin and is the same in both whole and decapitated coleoptiles.

M. A. B.  
**Oxidation-reduction potential of the cells of higher plants.** N. KRASSINSKY (*Protoplasma*, 1936, 25, 41—48).—Electrometric measurements on cell sap of beet, radish, pea, potato, and onion showed  $r_H$  15.5—18.8 in storage organs and 20.9 in growing

tissues.  $r_H$  of potato tubers increased by 1.5—2.0 on sprouting. M. A. B.

**Effect of soil moisture content on the physiological processes and chemical composition of sugar-beet.** A. KIRSANOV, V. BLAGOVESTSCHENSKI, and M. KAZAKOVA (*Bull. Moskauer Ver. Naturforsch.*, 1933, 42, Ser. 2; *Bied. Zentr.*, 1935, A, 6, 218—219).—Low soil- $\text{H}_2\text{O}$  contents (20% of total capacity) cause restricted C assimilation and increased respiration, increased chlorophyll and diminished xanthophyll contents, and high osmotic pressure in the cell sap. With excessive  $\text{H}_2\text{O}$  in the soil (100% capacity) the above effects are reversed. Max. yields of beet were obtained with 66% capacity. The % of sugar, N, and pectins reached highest vals. in the drier soils.

A. G. P.  
**Absorption of solutes by leaves.** D. LEWIS (*J. Pomology*, 1937, 14, 391).—Lettuce plants absorbed  $\text{PO}_4^{3-}$  through the leaves when sprayed with dil. solutions. No absorption of N or K under these conditions was apparent. A. G. P.

**Influence of environment on growth and metabolism of the tomato plant. II. Relationship between water content and assimilation.** R. MELVILLE (*Ann. Bot.*, 1937, [ii], 1, 153—174).—Prolongation of the normal night period induces an increase in the  $\text{H}_2\text{O}$  content of the plants. The dry wt. of plants increases with  $\text{H}_2\text{O}$  content to a max. beyond which dry wts. decrease rapidly with rising  $\text{H}_2\text{O}$  content. The optimum  $\text{H}_2\text{O}$  content is influenced by light. The influence of external factors on the C assimilation of plants is dependent on the previous history of the plant. A. G. P.

**Cation selection by higher plants.** R. COLLANDER (*Ber. deut. bot. Ges.*, 1937, 55, 74—81).—Differences in the intake of  $\text{K}^+$  by different species of plants from nutrients containing 2 milli-equiv. each of  $\text{Na}^+$ ,  $\text{K}^+$ , and  $\text{Rb}^+$  per litre were closely paralleled by those of  $\text{Rb}^+$  but showed no similarity with differences in the intake of  $\text{Na}^+$ . Similarly the intakes of  $\text{Ca}^{++}$  and  $\text{Sr}^{++}$  were parallel but differed from those of  $\text{K}^+$ . Differences in  $\text{Cs}^+$  intake resembled those of  $\text{K}^+$  and those of  $\text{Mg}^{++}$  (with some exceptions, e.g., in *Chenopodiaceae*) followed those of  $\text{Ca}^{++}$ .  $\text{K}^+$  was more and  $\text{Na}^+$  less easily taken up (except in halophytes) than the alkaline earths. The ease of intake of Mn was similar to that of  $\text{Sr}^{++}$ . A. G. P.

**Potassium-sodium contrast.** R. KELLER (*Protoplasma*, 1936, 25, 69—76).—Recent work on the contrasting electro-chemical properties of Na and K in biological material and the two groups of biologically positive and negative radicals is discussed.

M. A. B.  
**Structure of the plant cell wall.** A. FREY-WYSSLING (*Protoplasma*, 1936, 25, 261—300).—A review. M. A. B.

**Granule-forming cell substances pass through the living plasma lemma.** (Observations on epidermis cells of *Allium cepa*.) O. BANK and K. B. ESTERAK (*Protoplasma*, 1935, 24, 404—408).—Absorption of dyes (methylene-blue, Me-violet, crystal-violet, neutral-red, Me-green), followed by plasmolysis by neutral salts, causes colloidal substances, which

form granules with the dyes, to diffuse from the protoplasts of the epidermis cells through the plasma lemma, without injury to this or to the protoplasts. The granules show characteristic changes of form in warm (30—50°)  $\text{NO}_3^-$  solutions. Wounding or plasmolysis with  $\text{AgNO}_3$  has the same effect as treatment with dyes.

M. A. B.

**Visible structure of the secondary wall [in dicotyledons]: its significance in physical and chemical investigations of tracheary cells and fibres.** I. W. BAILEY and T. KERR (J. Arnold Arboretum, 1935, 16, 273—300).—The cellulosic matrix of the secondary wall is continuous but interspersed with non-cellulosic material (e.g., lignin) and two interpenetrating continuous systems may result.

CH. ABS. (p)

**Organic iron and hydrogen-ion concentration as factors affecting the rate of reproduction of *Lemna major*.** C. L. FLY (Proc. Oklahoma Acad. Sci., 1935, 15, 77—80).—In a modified Clark's nutrient in which  $\text{Fe}^{+++}$  was supplied as citrate, best growth was obtained in neutral or slightly alkaline media. The regeneration time was varied from 2.5 to 6 days by regulating the  $[\text{Fe}^{+++}]$  and  $p_{\text{H}}$  of the nutrient.

CH. ABS. (p)

**Plasmolysis and deplasmolysis: influence of salts and hydrogen-ion concentration.** V. S. ILJIN (Protoplasma, 1935, 24, 296—318).—Certain plants can tolerate plasmolysis for  $>20$  hr. in 2*M*-sucrose at any  $p_{\text{H}}$ , some are tolerant only in an acid, others only in an alkaline, medium. All are highly sensitive to the presence of inorg. salts. Ca has little effect except on calcifuge plants and the best buffer is generally  $\text{Ca}(\text{HCO}_3)_2$ . Sensitivity to Na varies greatly. Plasmolysis by conc. solutions and deplasmolysis must be carried out in 40 or 50 steps over about 6—8 hr. More rapid plasmolysis causes death and a slower rate produces a solid layer on the surface of the protoplasts.

M. A. B.

**Nucleus and protoplast after vital nuclear staining.** O. BANK (Protoplasma, 1936, 25, 188—195).—In a plasmolysing salt solution Me-violet, crystal-violet, and gentian-violet produced rapid selective vital staining of the nucleus of plant cells in a few min., "prune pure" (I) and Me-green took several hr., Bismarck-brown and fuchsin S gave no staining even after a day. Toxicity to the protoplast decreased approx. in the same order, but for each dye was greater in plasmolysing solutions of lower concn. In *M*-KCl and 2*M*- $\text{CaCl}_2$  (I) often stained the vacuoles. Violet dyes produced a violet stain, green dyes a green, except Me-green which gave violet. Faint staining could be rendered visible by mechanical pressure on the cover slip. In stained nuclei pressure caused colour changes and ultimate bleaching.

M. A. B.

**Cell sap of the Characeæ.** R. COLLANDER (Protoplasma, 1936, 25, 201—210).—Quant. spectrum analysis showed considerable variations in K, Na, Ca, Mg, Sr, and Cl according to species and growth medium, but, in general, uptake of cations decreased in the above order.

M. A. B.

**Reducing power of plant tissues.** R. SAVELLI (Atti R. Accad. Lincei, 1936, [vi], 24, 151—155).—Aq.  $\text{Na}_2\text{TeO}_4$  (0.1—0.5%) is reduced to Te by the tissues of various plants (especially, e.g., *Allium cepa*) to an extent differing with the various parts of each plant. With moulds, but not with the higher plants, formation of gaseous tellurides (?  $\text{TeH}_2$ ) occurs.

F. O. H.

**Acidosis in plants.** H. ENGEL (Bodenk. Pflanzenernähr., 1936, 1, 73—109).—Rapid root injury following exposure to media of  $p_{\text{H}}$  2.0—3.5 causes the passage of sap constituents from roots into the surrounding liquid. Under these conditions N compounds passing into the medium from lupins consisted largely of asparagine (I), those from *Vicia faba* of (I) and  $\text{NH}_2$ -acids in approx. equal proportions, and those from *Phaseolus* and *Pisum* were principally  $\text{NH}_2$ -acids. Fungi develop on the dead roots and decompose nitrogenous matter yielding  $\text{NH}_3$ . The cell nucleus resisted fungal attack for a considerable time. Acid media checked but did not change the course of the N metabolism of plants. Changes observed by Prianišnikov (B., 1932, 38) were post-mortal and not connected with the living cell.

A. G. P.

**Carbohydrate: nitrogen ratio of shoots of some tropical trees.** R. H. DASTUR and M. R. RAUT (J. Indian Bot. Soc., 1935, 14, 269—289).—Max. carbohydrate contents were reached during the vegetative and reproductive phases. N contents increased steadily from the beginning of the vegetative phase to the end of the flowering period in most cases and then decreased sharply. The C:N ratio was low at the ends of the vegetative and reproductive phases. High carbohydrate contents during the vegetative phase result from photosynthetic activity, and in the reproductive stage are due to upward translocation from storage organs.

CH. ABS. (p)

**Mechanism of secretion of organic substances by algæ.** B. S. ALEEV (Biochimia, 1936, 1, 94—100).—N compounds accumulate in culture media in amount  $\propto$  the age of the culture, and originate probably from autolysis of dead algæ.

R. T.

**Biochemistry of sotetsu, the Japanese sago plant. II. Chemical constituents, especially sex differences in stems.** K. NISHIDA and A. YAMADA (Bull. Agric. Chem. Soc. Japan, 1934, 10, 193—196).—The sugar, fibre, fat, and ash contents and peroxidase (I) activity of the cortex is  $>$  of the pith and, in male shoots only, the starch content is also higher in the cortex. Recently flowered female shoots contain less polysaccharides but more sugar, protein, ash, and (I) than other shoots.

CH. ABS. (p)

**Histochemistry. XII. Distribution of ascorbic acid in growing barley embryo.** D. GLICK (Z. physiol. Chem., 1937, 245, 211—216; cf. A., 1935, 1025).—In barley seedlings the ascorbic acid (I) content of the first leaf increases rapidly from the time of appearance until the 10th day of germination. This is accompanied by a decrease in the (I) content of the coleoptile and, between the 1st and 4th days, in that of the whole shoot. The (I) content of the whole root decreases from the 2nd day onwards, vals. being

higher in the tip. In the whole seedling the (I) content increases during the first 2 days and then decreases although, without leaf and root, it increases continuously. A positive correlation between the (I) and pigment (chlorophyll) contents of the various parts of the seedling is indicated. W. McC.

**Power of different varieties of wheat to form sugar.** N. J. SOSEDOV and Z. B. DROZDOVA (Biochimia., 1936, 1, 390—399).—The diastatic activity differed in the varieties of wheat examined and was not dependent on the locality in which the wheat was grown. W. O. K.

**Role of phosphates in the accumulation of sugar in the sugar beet.** N. M. SISAKJAN (Biochimia., 1936, 1, 301—320).—In the leaves of beet sugar plants grown in sand perfused with a nutritive salt solution, the synthetic action of the invertase (determined by the vac.-infiltration method) predominates during the early period of growth whilst the hydrolytic action becomes relatively more important at a later period. Removal of the  $\text{PO}_4^{3-}$  from the nutritive solution at any stage of growth results in an increase in the hydrolytic and a decrease in the synthetic action, the total activity remaining const. The sucrose content of the leaves is in general agreement with these results. W. O. K.

**Reversible action of invertase in plant cells, and the rôle of structural protoplasmic elements.** A. L. KURSANOV (Biochimia., 1936, 1, 411—424).—Introduction of small amounts of yeast invertase (I) by vac. infiltration into cyclamen, crinum, and primula leaves leads to acceleration of synthesis and hydrolysis of sucrose, to an equal extent; further introduction of (I) accelerates only the latter reaction. These results support the view that (I) is responsible for both processes, of which synthesis takes place at the surface of structural elements (mitochondria etc.), and hydrolysis in the solution. After saturation of the surfaces further addition of (I) leads to increase in its concn. in solution, but not in adsorption. Digestion of structural elements by autolysis (activation by exclusion of  $\text{O}_2$ , or by addition of papayotin or cysteine) similarly favours inversion of sucrose. R. T.

**Enzymic oxidation of morphine in poppy-head latex.** V. I. NILOV, V. P. NILOVA, and A. T. TROSCHTSCHENKO (Biochimia., 1936, 1, 165—182).—Oxidation of morphine, narcotine, and papaverine, but not of codeine, narceine, or thebaine, occurs in the latex under the influence of peroxidase and dehydrogenase. The loss of alkaloids in the opium amounts to 6.6—50% during two months, according to the variety of poppy. Oxidation in stored poppy-heads is > that in the latex, and is not inhibited by collection and storage at  $0^\circ$ . The of the latex falls to 5 during two months; adjustment of the initial  $p_H$  to 3 partly, and addition of KF totally, inhibits oxidation. R. T.

**Development of purine-nitrogen during germination.** P. DE GRAEVE (Compt. rend., 1937, 204, 445—447).—In certain germinating leguminous seeds uric acid (initially 0.6 g. per kg. dry matter) disappears rapidly. Allantoin passes a max. in about 5 days;

allantoic acid increases steadily and may account for >9% of the total N. R. M. M. O.

**Photosynthesis in green plants.** J. WEISS (J. Gen. Physiol., 1937, 20, 501—509).—Only chlorophyll (I) mols. on the lipin- $\text{H}_2\text{O}$  interface react with  $\text{CO}_2$ ; those within the lipid phase of the plastid communicate their photo-excitation to the former by some resonance effect. Such general mutual influence would explain difference in (I) absorption max. in living plastids and in solution. The lifetime of excited (I) mols. is of the order of the Blackman period. The ratio of surface to internal (I) determines the "photo-synthetic unit" and is 1:500. R. M. M. O.

**Effect of blue-violet rays on formation of carbohydrates in leaves.** R. H. DASTUR and S. SOLOMON (Ann. Bot., 1937, [ii], 1, 147—152).—Carbohydrate formation in leaves is increased by enrichment of illumination with blue-violet rays. A. G. P.

**Interaction of factors in the growth of *Lemna*.** X. Interaction of nitrogen and light intensity in relation to respiration. H. L. WHITE and W. G. TEMPLEMAN (Ann. Bot., 1937, [ii], 1, 191—204; cf. A., 1936, 908).—Respiratory rates calc. per unit leaf area or per unit dry wt. are diminished by N starvation. Increasing light intensity (300—1200 ft.-candles) causes increased respiration on an area basis as a result of increased photosynthesis and a consequent rise in carbohydrate level. On a dry-wt. basis respiration declines with increasing light intensity because of the more complete conversion of the photosynthate into non-respirable cellulose and reserve starch. The dependence of respiration rates on the contents of both N and carbohydrates is discussed. A. G. P.

**Respiration process in pure cultures of higher plants.** A. KUTEPOW (Diss., Würzburg, 1934; Bied. Zentr., 1935, A, 6, 318).—In maize and sunflower, germinated under sterile conditions, respiration rates are influenced by introduction of micro-organisms. Both  $\text{O}_2$  and  $\text{CO}_2$  involved in the exchange are affected. A. G. P.

**Respiration of roots and leaves of the rice plant (*Oryza sativa*, L.).** E. BAPTISTA (J. Indian Bot. Soc., 1935, 14, 159—165).—The  $\text{CO}_2$  evolution of roots was 82—200 and of leaves 163—400 mg. of  $\text{CO}_2$  per hr. per 100 g. of dry matter. Respiration rates fell soon after transplanting. CH. Abs. (p)

**Respiratory quotient of seedlings of *Lupinus albus* during early stages of germination.** F. N. CRAIG (J. Gen. Physiol., 1937, 20, 449—453).—The R.Q. of seeds soaked for 1 hr. is 1.00, for 9 hr. 0.76, for 12 hr. 0.9, and gradually! falls after longer periods. The fat oxidation system is activated early, but is probably not active from the first. R. M. M. O.

**Effect of wounding on respiration in the starving leaves of *Aralia gurlfuylei*.** A. B. SARAN (J. Indian Bot. Soc., 1935, 14, 299—304).—The  $\text{CO}_2$  output of leaves varied with the period of starvation prior to wounding, and reached max. after a 2.5-hr. period. Injection of glucose increased the output when the initial val. was 4.7 mg. of  $\text{CO}_2$  per hr., but

had no consistent effect when the initial val. was 6.4 mg. CH. ABS. (p)

**Plant hormones and mineral nutrition.** G. S. AVERY, jun., P. R. BURKHOLDER, and H. B. CREIGHTON (Proc. Nat. Acad. Sci., 1936, 22, 673—678).—The amount of growth hormone present in shoot tips of *Helianthus annuus*, L., and *Nicotiana tabacum*, var. Turkish, varied with the proportions of the cations and anions in the nutrient medium. Under field trials differences in hormone contents of tips were small even when the plants themselves showed marked nutrient-deficient symptoms. A. G. P.

**Action of  $\beta$ -indolylacetic acid on germination and development of seeds.** T. SOLACOLU and D. CONSTANTINESCO (Compt. rend. Soc. Biol., 1937, 124, 492—494).—0.01—0.04% of the acid decreases the germination with the production of intense hyperplasia. The formation of rootlets where the tissue is in contact with the acid is observed. H. G. R.

**Effect of phenylacetic and indolylbutyric acids on growth of tomato plants.** H. L. PEARSE (J. Pomology, 1937, 14, 365—375).—By spraying plants with solutions of  $\text{CH}_2\text{Ph}\cdot\text{CO}_2\text{H}$  (I) or indolylbutyric acid (II) the same responses (epinasty, swelling of stems and petioles, root initiation on stems) were obtained as by local applications of the growth-substances. Daily spraying with (I) or (II) for a week increased the height of the plants and the length of the internodes and petioles. Both depressed leaf growth, whereas (I) depressed and (II) increased root growth. Apical bud growth was gradually inhibited by both substances, (II) acting rather more rapidly. The ratio of the leaf wt. (dry basis) of (I)-treated plants to that of controls was unchanged by spraying for 2—3 weeks. The corresponding ratio for stems and petioles increased progressively. The  $\text{H}_2\text{O}$  content of plants sprayed with (I) or (II) was > that of controls. A. G. P.

**Two new chemical plant growth substances.** R. SNOW (Nature, 1937, 139, 27).—When mixed with lanoline and applied to decapitated oat coleoptiles,  $\text{Bz}_2\text{O}$  and  $\text{Bz}_2\text{O}_2$  markedly accelerate growth. The activity of  $\text{Bz}_2\text{O}$  is approx. 1/400 of that of hetero-auxin. L. S. T.

**Growth-substances or hormones, and the rooting of cuttings.**—See B., 1937, 170.

**Effects of certain glandular products on plant growth.** M. S. DUNN (Amer. J. Pharm., 1937, 109, 9—17).—The addition of either thyroxine or anterior pituitary extract to the culture solution in which twigs of *Populus nigra italica* were growing slightly stimulated the growth of the buds. E. H. S.

**Action of crystallised follicular hormone on cloves and radishes.** C. LIEBE (Biochem. Z., 1937, 289, 198—200).—Administration of solutions of this hormone led to an increase in yield of both cloves and radishes. P. W. C.

**Effect of exhausted frog muscle on growth of wheat seedlings.** V. DUSHKOVA (Protoplasma, 1935, 23, 217—220; Chem. Zentr., 1936, i, 2378).—Aq. extracts of exhausted muscle (but not those of non-exhausted muscle) had a stimulatory action. A. G. P.

**Influence of bios on nodule bacteria and legumes.** A. Influence of bios on legume seedlings. D. G. LAIRD and P. M. WEST (Canad. J. Res., 1937, 15, C, 1—6).—When germinated on solid (agar) media containing bios 2, the hypocotls of red clover grew vertically upwards while the cotyledons rested on the surface and probably absorbed nutrients. After 8—10 days secondary roots developed from the inverted root tip and grew downwards into the medium. The concn. of bios 2 necessary to cause max. bending of roots was 4 times that producing optimum stimulation of nodule bacteria. When the bios-containing nutrient was covered with untreated agar, growing roots did not bend on passing from untreated to treated strata. Hypocotl bending is caused by the fraction bios 2b, which in this but not in other physiological properties resembles hetero-auxin. Bios 2b induces rapid cell multiplication when applied to the parenchymatous lining of bean pods, the effect resembling that of a wound. A. G. P.

**Effect of thallium on plant growth.**—See B., 1937, 273.

***Fomes fraxineus* and its effects on ashwood.** H. B. S. MONTGOMERY (Ann. Appl. Biol., 1936, 23, 465—486).—The fungus shows optimum growth at 26° and  $p_H$  6.0. The presence of diastase, an emulsin, invertase, zymase, pectinase, catalase, oxidase, peroxidase, and a lipase in the mycelium is indicated. The effect of the N supply on the activity of the enzymes is correlated with that on growth. The actual N requirement is small. The fungus is moderately resistant to creosote, NaF, and  $\text{ZnCl}_2$ . A. G. P.

**Distribution of boron in *Vicia faba* and *Gossypium herbaceum*.** R. C. MCLEAN and W. L. HUGHES (Ann. Appl. Biol., 1936, 23, 231—244).—In these plants the largest amounts of B occur in leaves. The proportion in stems is > in petioles. Only small amounts are present in roots. In seed B is found only in the cotyledons. Absorption of B by plants is not directly dependent on the [B] of the nutrient. A. G. P.

**Determination of nitrites in green plants and plant extracts.** F. ALTEN and E. KNIPPENBERG (Bodenk. Pflanzenernahr., 1937, 2, 245—251).—The method is based on the colour produced by coupling diazotised atoxycocaine with  $\alpha\text{-C}_{10}\text{H}_7\cdot\text{NH}_2$  (Jendrassik, A., 1933, 687). Plant extracts are cleared with basic Pb acetate after appropriate adjustment of the reaction with a borate buffer ( $p_H$  10.5). Any residual colour in the extract is compensated in the colorimetric comparison by means of a second portion of the extract from which  $\text{NO}_2'$  has been removed by treatment with  $\text{AcOH}\text{-K}_4\text{Fe}(\text{CN})_6$ .  $1 \times 10^{-6}$  g. of  $\text{NO}_2'\cdot\text{N}$  may be detected. A. G. P.

**Lichens, fungi and algæ.** R. S. HILPERT, D. BECKER, and W. ROSSÉE (Biochem. Z., 1937, 289, 179—192).—Tables summarise the elementary compositions of a no. of lichens, fungi, and algæ and their cellulose, lignin, chitin, and pentosan contents. The skeletal substances are essentially different in these organisms from those of higher plants. Lichens and fungi contain no cellulose and algæ only a trace, the

cellulose-like constituent being sol. in alkali and in  $\text{NaHSO}_3$  and having the properties of a hemicellulose. Fungi differ from lichens in their high N content, which is probably not due to a high chitin content. The analytical vals. for fungi grown in light and in the dark show considerable differences. P. W. C.

**Calcium pectate and manganese content of raspberries.** W. DIEMAIR and F. MAYR (Z. Unters. Lebensm., 1936, 72, 470—475).—Spontaneous jelly formation in raspberry juice is dependent on the concn. of pectic substances and pectolytic enzymes and on acidity. The pectin content varies within wide limits. The Mn content of the ash varies from 0.01 to 1.5%. E. C. S.

**Organic acids of rhubarb (*Rheum hybridum*).**  
I. Malic acid of rhubarb and tobacco leaves.  
II. Organic acid composition of the leaves. G. W. PUCHER, H. E. CLARK, and H. B. VICKERY (J. Biol. Chem., 1937, 117, 599—604, 605—617).—I. The rhizomes, buds, petioles, and leaf blades of rhubarb and tobacco leaves contain only the *l*-isomeride of malic acid.

II. A group of unknown acids predominates in the blades of young leaves, followed by  $\text{H}_2\text{C}_2\text{O}_4$ , *l*-malic and citric acids. The petiole contains the acids in the order *l*-malic >  $\text{H}_2\text{C}_2\text{O}_4$  > citric > unknown acids. The total concn. of org. acids is nearly const. in all parts of the leaf. No correlation exists between  $\text{NH}_3$  and org. acid content. P. G. M.

**Lichen fatty acids from *Nephromopsis endocrocea*.**—Sec A., II, 134.

**Non-sugar reducing substances in plant juices.** F. S. SCHLENKER (J. Biol. Chem., 1937, 117, 727—731).—The more sensitive  $\text{K}_3\text{Fe}(\text{CN})_6$  method gives higher vals. for both the non-fermentable fraction and for the total reduction of plant juices than does the alkaline Cu tartrate method. Both methods give the same vals. for fermentable sugar. Alcoholic extracts of tomato, chrysanthemum, bean, and beet also show the presence of non-fermentable substances which account for  $\frac{1}{3}$   $\frac{1}{2}$  of the total reduction. P. W. C.

**Chemistry of the berries of *Rhus glabra*, L.** G. H. McFADDEN and R. L. McMURRAY (J. Amer. Pharm. Assoc., 1936, 25, 1154—1156).—Data for the solvent-extracted fractions, total N, total ash, and ash constituents of the shelled, air-dried berries are given. Extraction with light petroleum yields an oil,  $d_{20}^{20}$  0.9227,  $n_D^{20}$  1.4719,  $\alpha$  0°, acid val. 8.97, I val. 87.17, ester val. 150.23, sap. val. 159.2. F. O. H.

**Composition of hanfangchi oil.** C. F. HSÜ (J. Chinese Chem. Soc., 1937, 5, 14—21).—The oil (0.344%) extracted by 95% EtOH from powdered hanfangchi (*Stephania tetrandra*, S. Moore) contains unsaturated liquid fatty acids (48.60%) [oleic 41.61,  $\alpha$ -linoleic 6.94, linolenic 0.72, and a trace of an acid (bromide, m.p. 121—122°)]; saturated acids (37.1%) (palmitic 15.44, stearic 16.83, arachidic 0.18, and an acid, m.p. 91—92°, 0.19), unsaponifiable matter (12.09%) containing a sterol (probably sitosterol) 5.12, and a fatty acid 6.97%, and an unidentified essential oil. J. W. B.

**Pyrenium salts. XXVI. *i*-Inositol from red roses.** W. DILTNEY, W. SCHOMMER, J. THEWALT, and S. HENKELS (Z. physiol. Chem., 1937, 245, 171—174; cf. A., 1936, 1120).—The isolation of quercetin (I) and *i*-inositol (II) from the flowers of *Rosa gallica rubra* is described. (I) probably occurs partly free and partly combined. (II) occurs only in combined forms. W. McC.

**Composition of the wood of trunks and branches of principal indigenous trees.** G. BERTRAND and G. BROOKS (Compt. rend., 1937, 204, 162—164).—Wood of angiosperms yields, on acid hydrolysis, reducing sugars consisting principally of xylose. In gymnosperms mannose is the characteristic product. Plants of related species usually though not invariably yield similar proportions of the reducing sugar. In general, branches contain larger amounts of hydrolysable carbohydrate, ash, and N and less cellulose than do the corresponding trunks. A. G. P.

**Stachyose in the stems and roots of *Verbena officinalis*, L., and in the underground parts of *V. venosa*, Gill and Hook.** J. CHEYMOL (J. Pharm. Chim., 1937, [viii], 25, 110—117).—The roots (1250 g.) and stems (1168 g.) of *V. officinalis* and the roots (1200 g.) of *V. venosa* yielded cryst. stachyose (29, 16, and 36 g., respectively). W. O. K.

**Sterols and carbohydrates in fungi. I. *Boletus edulis*.** A. RATCLIFFE (Biochem. J., 1937, 31, 240—243).—Extraction with  $\text{Et}_2\text{O}$  of the finely powdered fungus yielded ergosterol together with a very small amount of a sterol, m.p. 169° (acetate, m.p. 174—175°), which closely resembled spinasterol. Extraction of the residue with EtOH gave trehalose. P. W. C.

**Hemicelluloses of the wood of English oak. III. Fractionation of hemicellulose-A.** M. H. O'DWYER (Biochem. J., 1937, 31, 254—257; cf. A., 1935, 421).—Hemicellulose-A on digestion with  $\text{H}_2\text{O}$  at 100° gives polysaccharide fractions but glucose (I) is not split off whereas digestion at  $p_H$  4.5 with taka-diastase gives two polysaccharides and, with -A from sapwood, 10% of the original material as (I). The blue colour given by -A of oak sapwood with I-KI is due to the portion of the complex which is split off as anhydroglucose residues on enzymic digestion. P. W. C.

**Anatomy and microchemistry of the cotton-seed.** M. GUREVITSCH (Maslob. Shir. Delo, 1935, 11, 301—302).—The colour reaction of resin glands with orcinol and phloroglucinol may be conditioned by the presence of gossypol and not by that of pentosans (I). (I) are present in the cellular integument of the ovule. CH. ABS. (p)

**Glucoside and enzyme in garlic, *Allium scorodoprasum*.** K. DATGO (J. Chosen Med. Assoc., 1935, 25, 439—470).—Hydrolysis of garlic extract yielded an essential oil, fructose (I), glucose (II), HCl,  $\text{MgCl}_2$ , EtOH,  $\text{H}_2\text{CO}_3$ , and Mg allyl sulphide (III). (I) is derived from inulin, EtOH and  $\text{CO}_2$  from (II). (II), (III), and HCl are possibly constituents of a glucoside, *alliumin*, hydrolysis of which yields the odorous oil. Myrosin occurs in the extracts. CH. ABS. (p)

Constitution of acacipetalin and a new cyanogenic glucoside from *Acacia lasiopetala*, Oliv., and *Acacia stolonifera*, Burch.—See A., II, 136.

Variations in the amino-acid composition of plant proteins, and their causes. A. KISTEL [with P. AGATOV, E. BEZINGER, and M. KASTRUBIN] (Biochimia, 1936, 1, 201—217).—Changes in the different  $\text{NH}_2$ -acid fractions of wheat and rye gliadin, wheat albumin, and edestin at different stages of maturity are recorded. R. T.

Determination of tyrosine in plant materials. Y. RAOUL (Compt. rend., 1937, 204, 197—200).—Appropriate modifications of the method of Folin and Ciocalteu (A., 1927, 892) are described. A. G. P.

Djengkolic acid.—See A., II, 139.

(A) Nuclein complex of French-bean seedlings. A. N. BELOZERSKI and S. D. TSCHIGIREV. (B) Nucleoproteins and nucleic acids of soya-bean seedlings. A. N. BELOZERSKI (Biochimia, 1936, 1, 134—146, 255—265).—Nucleoproteins of variable composition are obtained from French or soya-bean seedlings; they are mixtures of nuclear nucleoprotein, containing thymonucleic acid, and of artefacts originating from combination of cytoplasmic protein with phytonucleic acids. R. T.

Proteins. V. Crystalline globulin from the Paradise nut, *Lecythis zabucayo*. B. VENNESLAND, M. B. BLAUCH, and F. SAUNDERS (J. Amer. Chem. Soc., 1937, 59, 174).—The globulin, isolated (method: A., 1931, 661) from the fat-free seed-meal, resembles excelsin except for its  $\text{NH}_2$ -N content. The N distribution is determined. H. B.

Chemical investigation of the "Giftblaar," *Dichapetalum cynosum* (Hook), Engl. C. RIMINGTON (South African J. Sci., 1935, 32, 152—153; Chem. Zentr., 1936, i, 2571).—It was not possible to isolate the toxic principle; a pyrocatechol tannin, a yellow dye, two bases, and trigonelline were recognised. H. N. R.

Pigment of the yellow tomato. K. BRASS, A. BEYRODT, and J. MATTAUSCH (Naturwiss., 1937, 25, 60—61).—The absorption spectrum of the  $\text{CS}_2$  extract of the pith and skin of the fruit of yellow-fruited *Solanum lycopersicum* indicates the existence of (?  $\beta$ -)carotene and xanthophyll in both skin and pith, and a little lycopene in the pith only. A. J. M.

Phytosterols.—See A., II, 148.

Resinol of *Olea Cuminghamii*.—See A., II, 159.

Bitter principle from a South West African *Cucumis* species.—See A., II, 160.

Ayapin.—See A., II, 161.

Structure of asebotin, a component of *Andromeda japonica*, Thumb.—See A., II, 106.

Vital staining by use of solutions in serum-albumin. G. KISZELY (Magyar orvosi Arch., 1935, 36, 347—361; Chem. Zentr., 1936, i, 2597).—Serum-albumin acts as a protective colloid and prevents side-reactions of acid dyes (trypan-blue, pyrrole-blue). A. G. P.

Inexpensive recording manometer. F. J. NUTMAN (Ann. Bot., 1937, [ii], 1, 205—206).—Apparatus suitable for examination of stomatal movements is described. A. G. P.

Filtration of reactive infusion fluids. C. TUI, K. L. McCLOSKEY, M. H. SCHRIFT, and A. L. YATES (Proc. Soc. Exp. Biol. Med., 1936, 35, 297—300).—"Reactive" substances present in tap-water etc. pass the Berkefeld filter W but are adsorbed on a Seitz EK asbestos pad. They also pass all Zsigmondy "membran" filters coarser than the 200-sec. membrane. P. G. M.

Refractometric methods for determining total protein. C. SIEBENMANN (Biochem. J., 1937, 31, 205—211; cf. A., 1934, 222).—The refractometric change which occurs during heat-coagulation at  $p_{\text{H}}$  4.6 serves as a measure of the amount of protein in horse serum, and, for solutions containing 0.2—10% of protein, the results agree with those obtained gravimetrically. Reiss' method is developed as a graphic method. J. N. A.

Determination of galactose by Hagedorn and Jensen's method. E. F. GALE (Biochem. J., 1937, 31, 234—235).—A method for determination of galactose in the presence of bacteria is described, and a table summarises the ml. of 0.005N- $\text{Na}_2\text{S}_2\text{O}_3$  corresponding with 0.097—0.438 mg. of galactose. P. W. C.

Copper-iodometric determination of very small amounts of sugar.—See A., II, 136.

Determination of free and esterified glyceric acid.—See A., II, 133.

Colorimetric determination of carotene. V. A. KIRSANOVA (Biochimia, 1936, 1, 446—449).—A simplified modification of Russell's method (A., 1935, 1434) is described. The coloration of a light petroleum extract is compared with that of standard (0.036%)  $\text{K}_2\text{Cr}_2\text{O}_7$ . R. T.

Colorimetric determination of free and combined cholesterol. R. M. SMITH and A. MARBLE (J. Biol. Chem., 1937, 117, 673—684).—Cholesterol digitonide is dissociated in hot AcOH and the cholesterol acetate (which gives the same colour as an equiv. amount of free cholesterol) can be determined by the Bloor method after pptn. of the digitonin with light petroleum. A modification of the Bloor-Knudson method for cholesterol ester is suggested. P. G. M.

Quantitative precipitation of cholesterol digitonide in the presence of bile salts. J. T. BASHOUR and L. BAUMAN (J. Biol. Chem., 1937, 117, 551—553).—Cholesterol digitonide is quantitatively pptd. in the presence of bile salts if EtOH containing HCl slightly > the equiv. of the bile salts is added. F. A. A.

Determination of iron [in biological material]. Colorimetric o-phenanthroline method.—See A., I, 199.

Micro-magnetic determination of iron and its application to biology.—See A., I, 199.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

MAY, 1937.

Respiratory capacity, gaseous exchange, alveolar tension, and circulatory transport in normal man. E. CICOGNANI (Boll. Soc. ital. Biol. sperim., 1936, 11, 873—874).—Average vals. for 60 men and 30 women are given. F. O. H.

Apparatus for studying changes in expired air during expiration. F. GROSSE-BROCKHOFF and W. SCHOEDEL [with A. HAMPEL] (Pflüger's Archiv, 1936, 238, 204—212). M. A. B.

Blood of *Cobitis fossilis*. II. Periodic cycle of variation in composition and relation of certain states of the blood to respiration. H. LUPU (Ann. Sci. Univ. Jassy, 1935, 21, 407—455).—This fish undergoes periodic fluctuations in the red corpuscle count. Fluctuations in viscosity are parallel but extend to the serum, indicating that serum-proteins are also implicated in the total process. CO<sub>2</sub> accumulates in the blood at the same time as the hæmocytoysis develops. Physiological and histological studies and some notes on the chemical displacements are given. R. M. M. O.

Porphyrin in erythrocytes. K. LAGEDER (Klin. Woch., 1936, 15, 296—298; Chem. Zentr., 1936, i, 2966).—In certain diseases there is a marked increase of porphyrin in erythrocytes. A. G. P.

Sedimentation of erythrocytes in solutions of albumin, fibrinogen, and peptone. S. P. LUCIA and J. W. BROWN (Proc. Soc. Exp. Biol. Med., 1937, 35, 598—601).—Ox and human blood serum-albumin suspended in Locke's solution or plasma and dog bile in plasma prolong the sedimentation time of human red cells. Ox blood-fibrinogen, talc, or kaolin has no effect, and Witte's peptone a slight action. P. G. M.

Pseudo-agglutination of erythrocytes in dilute suspensions. M. RIGONI (Boll. Soc. ital. Biol. sperim., 1936, 11, 874—877).—When the sedimentation velocity of the corpuscles is relatively high, a 10% suspension of erythrocytes in the corresponding plasma rapidly forms sedimentation layers of three types of agglutination; with corpuscles of low velocity (as in certain diseases), this phenomenon does not occur. F. O. H.

Positive electric charge on erythrocytes. A. CARDIN and V. ZAMBOTTI (Boll. Soc. ital. Biol. sperim., 1936, 11, 750—751).—The character of the surface charge of erythrocytes depends on their concn. in the suspension medium; in dil. suspensions in ultrafiltrates of sera they are positively charged. F. O. H.

Micro-incineration of the red corpuscles of the teleost, *Cichlasoma fascetum*, Jen. A. POLICARD and P. ROJAS (Rev. soc. argentina biol., 1935, 11, 164—165).—Each cell gives a ring of brown ash containing Fe<sub>2</sub>O<sub>3</sub> enclosing a white Fe-free ash from the nucleus. CH. ABS. (p)

Cyanide hæmochromogen. Ferriheme hydroxide-cyanide reaction: its mechanism and equilibrium as determined by the spectro-electric method. T. R. HOGNESS, F. P. ZSCHEILE, jun., A. E. SIDWELL, jun., and E. S. G. BARRON (J. Biol. Chem., 1937, 118, 1—14).—Equilibria were studied by mixing various vols. of NaOH or NaOH-KCN and alkaline ferriheme (Hm) (cf. Pauling and Coryell, A., 1936, 867) solutions. Equilibrium was established rapidly. Varying [CN'] at const. gives a typical sigmoid curve for the association of Hm and CN. Varying total [Hm] tends to cause deviations from Beer's law, whereby the equation  $Hm_2(OH)_2 + 4CN' = 2Hm(CN)_2' + 2OH'$ , is developed, assuming polymerisation of Hm. Cl' is without effect on this relation, indicating that HmCl is largely hydrolysed. PO<sub>4</sub>''' combines with Hm giving a spectrum similar to that of Hm<sub>2</sub>(OH)<sub>2</sub>. R. M. M. O.

Water-soluble hæmin-C from blood. G. BARKAN and O. SCHALES (Z. physiol. Chem., 1937, 246, 181—193).—Erythrocytes (man, ox, horse, rabbit) yield directly, or after peptic or tryptic digestion, H<sub>2</sub>O-sol. hæmin-C which with C<sub>5</sub>H<sub>5</sub>N and nicotine gives hæmochromogens having spectra resembling that of cytochrome-C (absorption max. at approx. 549 mμ). W. McC.

Polarographic investigations of blood-pigments and their derivatives. I. Activation of hydrogen peroxide by hæmoglobin and hæmatin. R. BRDIČKA and C. TROPP (Biochem. Z., 1937, 289, 301—312).—Heyrovsky's polarographic method (A., 1932, 1101) indicates that the Fe complex in hæmatin (I) and hæmoglobin (II) solutions catalytically activates H<sub>2</sub>O<sub>2</sub>, the degree of activation depending on the concn. of the complex and  $p_H$ . The min. concns. of (I) and (II) producing detectable activation are  $8 \times 10^{-5}$  and  $20 \times 10^{-5}\%$ , respectively. KCN inhibits the effect. W. McC.

Variations in respiratory capacity of hæmoglobin and in resistance of blood-corpuscles in different levels of sedimented blood. Multiplicity of hæmoglobin. G. GALLERANI (Boll. Soc. ital. Biol. sperim., 1936, 11, 818—820).—The resistance to hæmolysis and the spectrophotometric quotients confirm previous indications (electric charge

and composition) of the multiplicity of hæmoglobin both in various species and in the same animal.

F. O. H.

**Amphoteric properties of hæmoglobin.**—See A., I., 240.

**Demonstration of blood on guns and bullets.** A. BRÜNING (Chem.-Ztg., 1937, **61**, 228—229).—Specks of red varnish from an oil-tight cartridge might be mistaken for blood since they give with alkaline  $N_2H_4$  a spectrum band at about 556 m $\mu$ , which is, however, weaker and broader, and extends more towards the *E*-line, than that of hæmochromogen. There is no trace of a band at 520 m $\mu$ .

R. M. M. O.

**Osmotic pressure and mol. wt. of various erythrocytins.** J. ROCHE and R. COMBETTE (Compt. rend., 1937, **204**, 155—157).—Data for the osmotic pressure at various concns. in  $M/15 PO_4'''$  buffer at  $p_H$  7.4 give vals. for the mol. wt. of the erythrocytin (plasmatic) of *Arenicola marina* and those (corpuscular) of *Dasybranchus caducus* and *Glycera gigantea* of 356,500, 25,080, and 54,500, respectively (cf. Svedberg and Eriksson, A., 1933, 965).

F. O. H.

**Separation of serum-albumin into two fractions. II. Nature of the glycoprotein fraction.** L. F. HEWITT (Biochem. J., 1937, **31**, 360—366; cf. this vol., 53).—Purified cryst. serum-albumin (I) ("crystalalbumin") is free from polysaccharide but as usually prepared contains a glycoprotein (II) ("seroglycoid"). Horse serum contains globulin 3.6, (I) 2.8, (II) 0.3, and mucoid 0.05% approx.

F. O. H.

**Viscous protein of syphilitic sera.** M. DOLADILHE (Compt. rend., 1937, **204**, 301—302; cf. Vernes, this vol., 15; Doladilhe, *ibid.*, 83).—Viscous protein, isolated from a syphilitic serum and mixed with normal serum, confers on the latter the flocculating properties of a syphilitic serum.

F. A. A.

**Elastic limits of plasma gels.** L. F. SHACKELL (J. Pharm. Exp. Ther., 1937, **59**, 333—349).—A method for determination of the elastic limit of a plasma gel is described. Addition of 0.2% of neoarsphenamine to normal horse plasma lowers the val., which is a function of the fibrinogen content, by about 80%; this effect is reduced by treatment with  $H_2O_2$  or exposure to air or  $O_2$ . The effect of dilution with serum, aq. NaCl, or  $H_2O$  has been studied.

P. G. M.

**Importance of the determination of protein-bound sugar in fractionation and identification of blood-proteins.** H. BIERRY (Compt. rend. Soc. Biol., 1937, **124**, 695—698).—The protein-bound sugar of the globulin fraction of horse plasma is 3—3.6% and that of the albumin fraction 0.4—1%. The presence of multiple globulins and albumins in plasma is indicated.

H. G. R.

**Effect of removal of lipins on the solubility of serum-proteins in potassium phosphate solution.** S. C. LIU and H. WU (Chinese J. Physiol., 1937, **11**, 323—327).—The solubility of natural serum-proteins is > that of those from lipin-free serum.

H. G. R.

**Effect of removal of lipins in the precipitability of serum-euglobulin.** S. C. LIU and H. WU (Chinese J. Physiol., 1937, **11**, 315—321).—Euglobulin (I) is more easily pptd. from lipin-free serum. The lipins do not affect the solubility of (I) in the serum and do not exist as free constituents.

H. G. R.

**Blood-lipins and -protein in Canadian Eastern Arctic Eskimos.** A. C. CORCORAN and I. M. RABINOWITCH (Biochem. J., 1937, **31**, 343—348).—Tabulated data for total lipins, neutral fat, fatty acid, total and free cholesterol, cholesteryl ester, and phospholipins of the blood (in two cases, before and after administration of 200 ml. of soya-bean oil) and for R.Q. vals. indicate an active and unusual mechanism for utilisation of fats.

F. O. H.

**Body-temperature and plasma-lipins in rabbits.** E. M. BOYD, J. H. ORR, and G. B. REED (Proc. Soc. Exp. Biol. Med., 1936, **35**, 479—482).—In healthy young rabbits there is no relation between variations in body-temp. (37.8—39.4°) and the concns. of phospholipin and free cholesterol in the blood-plasma.

W. McC.

**Lipin and mineral distribution in the serum and erythrocytes of normal children.** B. N. ERICKSON, H. H. WILLIAMS, F. C. HUMMEL, and I. G. MACY (J. Biol. Chem., 1937, **118**, 15—35).—Data for the contents of  $Na^+$ ,  $K^+$ ,  $Cl^-$ , phospholipin, neutral fat, cholesterol, and cholesteryl ester in plasma and corpuscles, resistance to aq. NaCl and saponin and dimensions of erythrocytes, and differential corpuscle counts are tabulated and compared with corresponding data for adults.

R. M. M. O.

**Determination of cholesterol in 0.1 c.c. of blood, serum, or plasma by the acetyl chloride method.** S. GORTZ (Biochem. Z., 1937, **289**, 313—319; cf. A., 1935, 270).—Serial determinations are made employing a special holder for 20 tubes in which the cholesterol is extracted during 30 min. with  $CHCl_3$  and purified, a mechanical shaker being used. The  $ZnCl_2$  reagent and (pure)  $AcCl$ , suitably preserved, remain fit for use for 1 month.

W. McC.

**Changes in the composition of the blood of the chick embryo during ontogenesis.** C. M. ZORN and A. J. DALTON (Proc. Soc. Exp. Biol. Med., 1936, **35**, 451—453).—Daily blood analyses made from the ninth day of incubation onwards until several days after hatching show that the sugar, uric acid, cholesterol, hæmoglobin, and erythrocyte contents increase greatly and almost regularly during the whole or part of the incubation period.

W. McC.

**Analysis of blood of five male and five female carabaos.** E. G. POSA (Philippine Agric., 1935, **24**, 388—392).—Average vals. obtained were: N 30.04, non-protein-N 28.55, urea 13.51, uric acid 1.57, creatinine 1.68, creatine 4.43, Cl (as NaCl) 477.3, Ca 28.19, sugar 73.65 mg. per 100 ml. Serum-Ca was > twice that recorded for other farm animals.

CH. ABS. (p)

**Chicken blood.** A. C. GONZAGA (Rept. New York State Vet. Coll., 1933—1934, 53—57).—Concs. of sugar and of non-protein-N are high in blood of young chicken and gradually decrease with age.

Simultaneously urea-N, Fe, hæmoglobin (I), and  $O_2$  vol. increase slightly. The uric acid (II) content is highest in 1-day chicks and in those 2—4 months old. Sugar, total non-protein-N, urea-N, and (II) in venous blood are >, and Fe, (I), and  $O_2$  <, in arterial blood. CH. ABS. (p)

**Micro-bioassay of acetylcholine.** G. KATZ (Proc. Soc. Exp. Biol. Med., 1937, 35, 544—545).—Details are given of a method for the determination of acetylcholine in 0.3 c.c. of blood or serum with an error of  $\pm 20\%$ , using the contraction of the leech muscle. P. G. M.

**Determination of morphine in blood.** J. W. MULL (Proc. Soc. Exp. Biol. Med., 1937, 35, 551—553).—A colorimetric modification of Sanchez' method is described. 0.0025 mg. of morphine can be determined in 1 c.c. of whole blood. P. G. M.

**Indicanæmia during gestation, parturition, and puerperium.** R. A. FERRARI (Rev. sudamer. endocrinol., 1935, 18, 690—701).—Normal blood-indican varied between 0.03 and 0.12%. No increase occurred during gestation etc. CH. ABS. (p)

**Determination of minute amounts of atebirin in blood.** R. N. CHOPRA and A. C. ROY (Indian Med. Gaz., 1935, 70, 504—505).—Oxalated blood soaked on filter-strips and dried is extracted with  $Et_2O$ . The residue is dissolved in 0.1N-HCl and the filtered solution used for colorimetric determination using NaOH and  $C_6H_{11}OH$ . 0.005—0.025 mg. of atebirin may be determined with an error of <0.003 mg. CH. ABS. (p)

**Bisulphite-binding substances in blood in health and disease (vitamin- $B_1$  deficiency).** R. W. WILKINS, F. H. L. TAYLOR, and S. WEISS (Proc. Soc. Exp. Biol. Med., 1937, 35, 584—585).— $HSO_3^-$ -binding substances in blood are increased in disease, particularly vitamin- $B_1$  deficiency. P. G. M.

**Blood-sugar and glucose tolerance at high altitudes.** W. H. FORBES (Amer. J. Physiol., 1936, 116, 309—316).—Glucose tolerance is increased at high altitudes in acclimatised subjects whose tolerance curves at sea-level are normal. The slight increase recorded in blood-sugar cannot with certainty be attributed to the altitude. R. N. C.

**Does mental function depend on normal blood-sugar concentrations?** E. POWELL (Tri-State Med. J., 1935, 7, No. 5, 1421—1422, 1431).—Pancreatic involvement leading to hyperinsulinism with fasting blood-sugar level of 48—60 mg. per 100 c.c. depressed mental functions. CH. ABS. (p)

**Plasma-sugar of decapods.** M. FLORKIN (Bull. Acad. roy. Belg., 1936, [v], 22, 1359—1367).—The plasma-sugar of *Carcinus maenas*, *Homarus vulgaris*, *Palinurus vulgaris*, and *Maia squinado* is approx. 0.010% under normal conditions and, with *C. maenas*, falls practically to zero after a fast of 14 days. E. M. W.

**Effect of saccharin and galactose on blood-sugar.** T. L. ALTHAUSEN and G. K. WEVER (Proc. Soc. Exp. Biol. Med., 1937, 35, 517—519).—No reflex hyperglycæmia is produced by ingestion of saccharin or galactose. P. G. M.

**Spectrophotometric determination of ascorbic acid in blood.** A. CHEVALLIER and Y. CHORON (Compt. rend. Soc. Biol., 1937, 124, 743—744).—The method previously described (this vol., 155) has been adapted for use with 4 c.c. of blood. H. G. R.

**Lactic acid in rest and work at high altitudes.** H. T. EDWARDS (Amer. J. Physiol., 1936, 116, 367—375).—Resting blood-lactic acid (I) shows an initial slight rise above sea-level vals. on arrival at high altitudes, but returns to sea-level vals. after acclimatisation even at 6140 m. where arterial saturation is 55—70%. (I) augmentations after standard work performances also show rises initially, but become normal after acclimatisation. The ability to accumulate (I) falls with increase of altitude, and only slight increases over resting vals. occur at 6140 m. R. N. C.

**Disappearance of propylene glycol from the blood stream.** H. W. NEWMAN and A. J. LEHMAN (Proc. Soc. Exp. Med., 1937, 35, 601—603).—50% of propylene glycol (I) injected intravenously can be recovered in the urine; it is rapidly absorbed from the stomach. 1.10% of (I) in blood is required to produce the same narcosis as 0.35% of EtOH. P. G. M.

**Variations in the blood-alcohol curve produced at different times after a meal.** A. GALAMINI and V. CELLI (Boll. Soc. ital. Biol. sperim., 1936, 11, 892—894).—The inhibitory action of ingested food on the increase in blood-EtOH due to drinking aq. EtOH persists for approx. 4 hr. after the meal. F. O. H.

**Distribution of bases between cells and serum of normal human blood.** P. M. HALD and A. J. EISENMAN (J. Biol. Chem., 1937, 118, 275—288).—Vals. are given for the concns. of  $H_2O$ , K, Na, Ca, Mg, and total base in normal human sera and red blood cells. F. A. A.

**Calcium content of plasma and serum.** H. THELEN (Z. physiol. Chem., 1937, 246, 194—202; cf. Streef, A., 1936, 1284).—The Ca contents of serum and plasma remain const. after the blood is drawn and hence the findings of Waelsch *et al.* (A., 1935, 1142) are not confirmed. W. McC.

**Calcium and protein changes in serum during sleep and rest without sleep.** N. COOPERMAN (Amer. J. Physiol., 1936, 116, 531—534).—Total serum-Ca and -proteins decrease, and  $Ca^{++}$  increases slightly, during periods of 5—7 hr. of sleep or rest. In shorter periods of  $1\frac{1}{2}$ —2 hr., total Ca shows a more marked decrease whilst  $Ca^{++}$  is unaffected; these changes can be correlated with an increase in circulating plasma vol. The view that Ca passes from the blood-stream into the tissues during sleep is not supported. R. N. C.

**Colorimetric determination of serum-magnesium based on hydroxyquinoline precipitation.** W. S. HOFFMAN (J. Biol. Chem., 1937, 118, 37—45).—Mg is pptd. from serum (2 c.c.) by 8-hydroxyquinoline, which is determined in the ppt. colorimetrically (photo-electric method) by its reaction with  $Fe^{+++}$  in dil. HCl. The normal val. in man is  $0.00218 \pm 0.00015\%$ . R. M. M. O.

**Potassium and the alkaline reserve of coleoptera.** A. DRILHON and R. G. BUSNEL (Compt. rend. Soc. Biol., 1937, **124**, 806—807).—[K<sup>+</sup>] in the hæmolymp is const. in different species but a variation is observed in the alkaline reserve. H. G. R.

**Lead in human blood.** J. H. McMILLEN and G. H. SCOTT (Proc. Soc. Exp. Biol. Med., 1936, **35**, 364—365).—Spectrographic examination showed that the blood of 83 healthy male and 6 healthy female students contained  $\geq 0.0019$  mg. of Pb per c.c.

W. McC.

**Micro-determination of sulphur in blood.** S. LORANT (Biochem. Z., 1937, **289**, 425—431).—Total non-protein-S is colorimetrically determined in 3 c.c. of deproteinised plasma or serum after destruction of org. matter with  $\text{KNO}_3 + \text{Na}_2\text{B}_4\text{O}_7$  at 450—500° and pptn. of S as benzidine sulphate;  $\text{SO}_4^{--}\text{S}$  is determined directly in the deproteinised liquid. Interference by  $\text{PO}_4^{--}$  is prevented by adding  $\text{HNO}_3$  before pptn. of  $\text{SO}_4^{--}$  and interference by  $\text{Cl}^-$  by addition of  $\text{AgNO}_3$ ,  $\text{AgCl}$  being subsequently removed with conc. aq.  $\text{NH}_3$ . W. McC.

**Blood-bromine during sleep.** G. MORUZZI (Boll. Soc. ital. Biol. sperim., 1936, **11**, 728—730).—The total blood-Br in man (cf. A., 1936, 1135) shows no significant variation between day and night vals.; the content of Br not pptd. by Folin's  $\text{H}_2\text{WO}_4$  reagent (i.e., inorg. Br), however, increases during the night.

F. O. H.

**Osmotic adjustments between cells and serum in the circulating blood of man.** A. J. EISENMAN, P. M. HALD, and J. P. PETERS (J. Biol. Chem., 1937, **118**, 289—299).—Changes in cell vol. and redistribution of  $\text{H}_2\text{O}$  between red blood cells and serum in patients after injection of hypertonic aq. NaCl indicate that the cells act *in vivo* as simple osmometers, impermeable to base; chemical analysis, however, shows that bases traverse the membranes. In similar experiments *in vitro*, no base is transferred. It is suggested that in both cases the cells act as osmometers,  $\text{H}_2\text{O}$  being transferred, but that *in vivo* base is also transferred in response to other (metabolic) processes.

F. A. A.

**Origin and significance of blood-serum enzymes.** L. A. CRANDALL, jun. (Amer. J. Dig. Dis. Nutr., 1935, **2**, 230—235).—A review.

CH. ABS. (e)

**Inactivation of pneumococcal hæmolysin by sterols.** B. COHEN, H. SCHWACHMAN, and M. E. PERKINS (Proc. Soc. Exp. Biol. Med., 1937, **35**, 586—591).—The inhibiting effect of cholesterol etc. on pneumolysin is determined by the  $\cdot\text{OH}$  and the double linking, peroxide formation being of secondary importance. The free  $\cdot\text{SH}$  of the active lysin remains free after cholesterol treatment. Air-oxidised lysin is almost unaffected by cholesterol. P. G. M.

**Molecular interaction in monolayers. I, II.** See A., I, 235.

**Is heparin an antithrombin?** A. J. QUICK (Proc. Soc. Exp. Biol. Med., 1936, **35**, 391—392).—The rate of coagulation by prothrombin (pptd. from human plasma with  $\text{CO}_2$ , dissolved in  $\text{H}_2\text{O}$ , and treated with  $\text{CaCl}_2$ ) is not affected by addition of

heparin, which is not an antithrombin (I) or an anti-prothrombin but reacts with a constituent of the plasma to form (I). W. McC.

**Coagulation defect in peptone shock: anti-thrombins.** A. J. QUICK (Amer. J. Physiol., 1936, **116**, 535—542).—The curve of the clotting time of dog plasma after intravenous injection of peptone against progressive dilutions of thrombin (I) is very similar to the curve of the clotting time after heparin (II) against the same dilutions. Incoagulability in peptone shock is considered to be due to production of a (II)-like anticoagulant, which differs from the normal antithrombin of blood in its rate of neutralisation of (I). R. N. C.

**Relationship between alexin and the viscous protein of serum.** M. DOLADILHE (Compt. rend., 1937, **204**, 382—383).—Prolonged dialysis of serum yields a viscous protein prep., readily flocculated by  $\text{H}^+$  and possessing high alexic activity. F. O. H.

**Titration of the alexic power of human sera.** F. MEERSEMAN (Compt. rend. Soc. Biol., 1937, **124**, 767—769).—Details are given for determination of the hæmolytic index and alexic power of serum.

H. G. R.

**Alexic power of normal and pathological sera.** F. MEERSEMAN and H. PERROT (Compt. rend. Soc. Biol., 1937, **124**, 770—771).—In normal subjects the val. is 4—6 and is relatively const. In hepatic diseases, anaphylactic states, and malaria a low val. is observed, whilst in tuberculosis and infections of the respiratory tract the val. is variable. H. G. R.

**Identity of agglutinins and precipitins.** A. P. DI SORRENTINO (Boll. Soc. ital. Biol. sperim., 1936, **11**, 711—714).—The difference in action of intramuscularly injected quinine on agglutinins and precipitins indicates their non-identity. F. O. H.

**Determination, purification, and concentration of antigens and anti-bodies.** A. TASMAN (Chem. Weekblad, 1937, **34**, 230—241).—A review dealing particularly with diphtheria and tetanus toxins, anti-toxins, and anatoxins. S. C.

**Antigenic nature of melanin.** I. L. KRITSCHESKIVSKI and P. L. RUBINSTEIN (Z. Immunitats., 1935, **84**, 397—404; Chem. Zentr., 1936, i, 3160—3161).—Melanin (I) from the retina of cattle is a hapten which, in combination with pig serum, produces in immunised rabbits a sp. antibody giving a precipitation reaction with (I). By immunising birds by means of dead parasites of bird malaria an antibody for melanin is produced. A. G. P.

**Anti-complementary action of matured extracts of organs.** F. HAHN (Z. Immunitats., 1935, **84**, 380—397; Chem. Zentr., 1936, i, 3160).—Maturing of ox-heart extracts associated with the development of anti-complementary functions is dependent on oxidation processes and is facilitated by alkaline conditions. Maturation proceeds with the peptisation of colloids in the extract and depends on the initial dispersion. Anti-complementary properties may be associated with the formation of soap-like substances by hydrolysis and oxidation during the maturing process. A. G. P.

**Adsorption of diphtheria toxin and toxoid on colloidal gels.** F. A. MILLER, T. DE VRIES, and M. A. MILLER (Proc. Indiana Acad. Sci., 1934, 44, 88—92).— $\text{Al}(\text{OH})_3$ ,  $\text{Ca}_3(\text{PO}_4)_2$ , and  $\text{SiO}_2$  gels adsorb considerable amounts of the toxin and the rate of release when injected into animals was relatively slow. CH. ABS. (p)

**Polysaccharide of the typhus bacillus. IV. Action of antipolysaccharide sera on the polysaccharide. V. Action of antipolysaccharide sera on the bacilli and their lysates.** A. SPANEDDA (Boll. Soc. ital. Biol. sperim., 1936, 11, 931—933, 933—934; cf. A., 1936, 1403).—IV. The blood of immunised rabbits, injected in varying amounts with 1 mg. of polysaccharide (I), exhibits an antitoxic action to (I); this is greatest with sera of which the agglutinin titre has been diminished by continuous injection of (I).

V. Antipolysaccharide serum slightly neutralises the living bacilli and their lysates, whilst the vaccine-serum enhances the toxicity; the serum inactivates the endotoxin of *B. typhosus*. F. O. H.

**Isoelectric point of animal tissues. V. Certain cells.** G. YASUZUMI (Folia Anat. Japon., 1935, 8, No. 4, 465—472).—The isoelectric point of old and young rabbit epithelial cells from the oesophagus was 4.2 and 3.2, duodenum 4.1, 3.6, intestine 4.0, 3.4, kidney glomerulus 7.0, 4.6. Similar vals. apply to mice. For human adult erythrocytes the val. was 6.70, and for the foetus 6.45. CH. ABS. (p)

**Electrolyte content of human autopsy tissue.** E. MUNTWYLER, R. F. HANZAL, G. H. MANGUN, and C. T. WAY (Proc. Soc. Exp. Biol. Med., 1937, 35, 555—556).—The  $\text{H}_2\text{O}$  content is highest in kidney, lowest in liver;  $\text{Cl}^-$  highest in kidney, lowest in skeletal muscle; P highest in liver, lowest in right ventricle; Na highest in kidney, lowest in left ventricle; K highest in skeletal muscle, lowest in kidney; Ca and Mg highest in right ventricle, lowest in spleen. P. G. M.

**Pharmacognosy of *Spongia fluviatilis*.** P. OFICJALSKI (Pharm. Zentr., 1937, 78, 173—175).—Data for the ash constituents of two species of siliceous sponges are given. The I content was 0.0005—0.002% of the dry sponge and highest for sponges collected in winter. F. O. H.

**State and localisation of inorganic salts in the skin as revealed by extraction and micro-incineration.** D. J. KOOYMAN (Arch. Dermatol. Syph., 1935, 32, 394—403).—Effects of extraction with org. solvents and with  $\text{H}_2\text{O}$  prior to incineration are recorded and discussed. CH. ABS. (p)

**Bromine content of various organs.** G. MORUZZI (Boll. Soc. ital. Biol. sperim., 1936, 11, 725—728).—The Br contents of organs and tissues of the ox show no great differences. F. O. H.

**Sulphur content of hair and nails in abnormal states. II. Nails.** J. V. KLAUDER and H. BROWN (Arch. Dermatol. Syphilol., 1935, 31, 26—34).—Only 10% of abnormal nails contain normal amounts of S. Administration of hydrolysed wool increased the S content of nails only in a few cases. Subnormal S vals. occurred in normal nails in certain

systemic infections. Nails of patients sensitised to light had normal S contents. CH. ABS. (p)

**Detection of phosphates in ashed tissue.** C. BARIGOZZI (Boll. Soc. ital. Biol. sperim., 1936, 11, 836—837).—Distribution of  $\text{PO}_4^{4-}$  in spodiograms (tissue ashed so as to retain histological characteristics) is determined by treatment with 1 g. of  $\text{NH}_4$  molybdate + 12 c.c. of  $\text{HNO}_3$  (d 1.18) followed by gentle heating, the process being performed in  $\text{SiO}_2$  vessels. F. O. H.

**[Carbonate content of inorganic bone material and its synthesis.]** R. KLEMENT (Ber., 1937, 70, [B], 468—469; cf. A., 1936, 1533).—A reply to Gassmann (this vol., 86). H. W.

**Cattle bones. General composition of pig bones.** M. SATTO (Rep. Inst. Sci. Res. Manchukuo, 1936, 1, 63—82).—High  $\text{H}_2\text{O}$  content of bones is associated with high protein (I) and low ash, and low  $\text{H}_2\text{O}$  content with low (I) and high ash. Ash contents are relatively low in the vertebral column, high in the extremities, showing a gradient in the limbs, and max. in the skull. The ratio of P:Ca in ash is generally const. (1:2.2) although actual P and Ca contents vary. The amount of (I) convertible into gelatin is 25—53% of the total. Distribution of N in the total (I) is very similar to that of gelatin, except that small quantities of cystine, tyrosine, and tryptophan are present. R. M. M. O.

**Does pyrophosphate occur in muscle and tissue?** B. UMSCHWEIF and K. GIBAYLO (Z. physiol. Chem., 1937, 246, 163—170; cf. Ferdmann *et al.*, A., 1936, 754).—Free inorg.  $\text{P}_2\text{O}_7^{4-}$  does not occur in liver, kidneys, lungs, heart, brain, or spinal marrow (rabbit) or in resting or exhausted muscle (rabbit, frog). W. McC.

**Creatine, potassium, and phosphorus content of cardiac and voluntary muscle.** G. H. MANGUN and V. C. MYERS (Proc. Soc. Exp. Biol. Med., 1936, 35, 455—456).—In man, increase in the wt. of the heart is accompanied by progressive decrease in its creatine (I), K, and P contents. Frequently the respective decreases are in the ratio 3:2:1. Part of (I) probably occurs as diphosphocreatine. W. McC.

**Nitrogen content of skeletal muscle of the rat in various nutritional states.** A. J. BARTOLI, C. I. REED, and H. C. STRUCK (Proc. Soc. Exp. Biol. Med., 1937, 35, 528—532).—Growth-hormone given intraperitoneally increases the total N and  $\text{H}_2\text{O}$  contents of the quadriceps muscle of rats on a normal diet. P. G. M.

**Nitrogenous constituents of the liver of the shark, *Acanthias vulgaris*.** D. ACKERMANN and M. MOHR (Z. Biol., 1937, 98, 37—42).—Thymine,  $\text{NMe}_3\text{O}$ , lysine, ornithine, tyrosine, leucine, taurine, scyllite, and spinazine,  $\text{C}_9\text{H}_{14}\text{O}_4\text{N}_4$ , decomp. 263—267°, were isolated. F. O. H.

**Extractives of embryos of the shark, *Acanthias vulgaris*.** W. SPAHR (Z. Biol., 1937, 98, 43—48).—In addition to betaine, choline, and arginine, EtOH extracts yield  $\text{NMe}_3\text{O}$ , histidine (I), and hypoxanthine; qual. analysis indicates the presence of

guanine, xanthine, and adenine. The (I) fraction contains a substance, other than (I), pptd. as Ag salt.

F. O. H.

**Creatine content of human voluntary muscle.** J. F. CORSARO (Proc. Soc. Exp. Biol. Med., 1937, 35, 554).—Vals. up to 550 mg. per 100 g. are found for muscle-creatine in uræmia, pneumonia, tuberculosis, early malignancy, etc., whilst low vals. ( $>250$  mg.) may be found in acute inflammatory diseases, late malignancy, etc.

P. G. M.

**Identification of bases in animal tissues.** D. ACKERMANN (Z. physiol. Chem., 1937, 246, 113—114).—The detection of choline and betaine in neosine (isolated as aurichloride) affords a further example of the obstinate retention of impurities in the aurichlorides isolated from animal tissues.

H. W.

**Properties of alligator fat.** A. NEMBROT and B. CADROBBI (Annali Chim. Appl., 1936, 26, 571—572).—The body-fat, m.p.  $34-35^{\circ}$ ,  $d_{4}^{15}$  0.924,  $n_{D}^{25}$  1.568, sap. val. 194.9, I val. 129—133, contains 0.4% of unsaponifiable matter.

F. O. H.

**Are neutral fat and lecithin present in gall bladder bile?** K. K. JONES and R. O. SHERBERG (Proc. Soc. Exp. Biol. Med., 1937, 35, 535—537).—Neutral fat and lecithin are not constituents of the gall bladder of the ox, dog, or hog.

P. C. M.

**Determination of mol. wt. of lipins.** H. SCHMALFUSS (Fette u. Seifen, 1937, 44, 60—61).—Variations in the composition of phosphatides and their effect on mol. wt. are discussed. Rewald's val. for mean mol. wt. (A., 1928, 1154) should be 787, not 880.

F. C. B. M.

**Reducing substance in brain.** M. MITOLO (Boll. Soc. ital. Biol. sperim., 1936, 11, 697—699).—Bonsignore's work (A., 1936, 1286) is discussed and criticised. Prior publication (Young and Mitolo, A., 1934, 543) is claimed.

F. O. H.

**Modification of the Bierry-Gruzewska method of determining liver-glycogen.** F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1936, 11, 735—737).—The tissue is hydrolysed by 60% KOH followed, after neutralisation, by 5% HCl and the hydrolysate cleared by  $Zn(OH)_2$ , glucose in the filtrate being determined by Bertrand's method.

F. O. H.

**Colloidal substance of the thyroid gland indicated by Mallory's stain.** A. BUSINCO and G. NICOLOSI (Boll. Soc. ital. Biol. sperim., 1936, 11, 928—930).—The staining reactions of histological elements of the thyroid are described and discussed.

F. O. H.

**Refractive index of egg-white. Changes with age, season, and development.** A. L. ROMANOFF and R. A. SULLIVAN (Ind. Eng. Chem., 1937, 29, 117—120).—The  $n$  of each of the four layers of white is an approx. measure of total solids and, in any egg, increases from the outer to the inner (chalaziferous) layer, the vals. for each layer in fresh eggs passing through a max. in the breeding season (Feb.—March). In unfertilised eggs, ageing increases the  $n$  of all layers except the inner, where it passes through a min. and then becomes const. at its original value, whilst in fertilised eggs (incubated) the layers rapidly

disintegrate and  $n$  rises to a max. after 30—40 days, and later decreases.

R. C. M.

**Structure of proteins. Ox hæmoglobin, ovalbumin, ox fibrin, and gelatin.** M. BERGMANN and C. NIEMANN (J. Biol. Chem., 1937, 118, 301—314).—Vals. are given for the distribution of 8  $NH_2$ -acids in cattle hæmoglobin and ovalbumin. The data for these and other proteins show how these proteins differ in the arrangement of the  $NH_2$ -acids, and yield vals. for mol. wts. in good agreement with vals. obtained by physical methods.

F. A. A.

**State of combination of phosphorus in phosphoproteins.** S. RAPOPORT (Biochem. Z., 1937, 289, 420—424).—In caseinogen  $\approx 33\%$  of the P is not united to the serine residue but probably all the P of vitellin is thus combined.

W. McC.

**Extraction of nucleoproteins from liver and muscle.** A. CARDIN and O. PINOTTI (Boll. Soc. ital. Biol. sperim., 1936, 11, 752).—Liver and muscle (calf), on incubation at  $37^{\circ}$  followed by extraction with aq. NaCl, filtration, and pptn. from the filtrate by AcOH, yield nucleoprotein (P 0.45 and 0.37%, respectively).

F. O. H.

**Denaturation and hydration of proteins. II. Surface denaturation of ovalbumin.** H. B. BULL and H. NEURATH (J. Biol. Chem., 1937, 118, 163—175; cf. A., 1936, 1404).—In aq. solutions of purified ovalbumin (I), there is an inverse relation between the degree of surface denaturation produced by shaking and the concn. of (I). During the denaturation the  $p_H$  changes by amounts which vary according to the original of the solution. The rate and extent of denaturation are scarcely affected by addition of concns.  $<0.01N$  of electrolytes but the rate is greatly affected by change in and is max. at the isoelectric point. Low concns. of  $n$ -heptyl alcohol inhibit denaturation.

W. McC.

**Elastic properties of the elastic and collagen fibres and their molecular significance.** K. H. MEYER and C. FERRI (Pflüger's Archiv, 1936, 238, 78—90).—Comparison of the thermo-elastic properties of tendon before and after treatment with  $CH_2O$  with those of rubber before and after vulcanisation suggests that in tendon the mols. are in the form of long chains which are normally arranged parallel to the axis of the fibre.

M. A. B.

**Extraction and solubility of the substances present in the pigment of the eyes of *Drosophila melanogaster*.** Y. KHOUVINE, B. EPHRUSSI, and M. H. HARNLY (Compt. rend., 1936, 203, 1542—1544).—The pupæ of *Galleria mellonella* and *Calliphora erythrocephala* contain the two diffusible substances postulated by Ephrussi and Harnly (*ibid.*, 1028). Solutions of the two substances can be prepared by extraction with EtOH or EtOH-Et<sub>2</sub>O of the semi-liquid mass obtained by pressing the pupæ of *Calliphora* which have been immersed in liquid air. The substances are not of an enzyme or protein character.

J. N. A.

**Development of eye colours in *Drosophila* pupal transplants and the influence of body-fluid on vermillion.** G. W. BEADLE, C. W. CLANCY,

and B. EPIRUSSI (Proc. Roy. Soc., 1937, B, 122, 98—105).—Experiments involving the transfer of body-fluid between wild-type (dark red-eyed) *Drosophila* (larvæ and pupæ) and the vermilion-eyed variety show that the substance responsible for this difference is present in the body-fluid of wild-type flies between 3 and 80 hr. after puparium formation. Vermilion eye disks, transplanted, as late as 65 hr. after puparium formation, into wild hosts, develop the eye colour of the latter. F. A. A.

Toad poisons. X.—See A., II, 208.

Ambergris.—See B., 1937, 391.

Hydrolysis of polysaccharide acids of vitreous humour, umbilical cord, and of streptococcus by autolytic enzyme of pneumococcus. K. MEYER, R. DUBOS, and E. M. SMYTH (J. Biol. Chem., 1937, 118, 71—78).—The enzyme system specifically hydrolyses (optimum  $p_H$  5.8) the polysaccharide acids of the vitreous humour (hyaluronic acid) and of Wharton's jelly and the serologically inactive acid from mucoid group A streptococci (cf. this vol., 183). The kinetics of the hydrolyses indicate the identity of these three acids, which are not hydrolysed by other polysaccharidases. Acetylglucosamine, glucosamine, and glycuronic acid do not influence the reaction. The hydrolysis, like the bacteriolysis, is inhibited by I and subsequently reactivated by reducing agents. Polysaccharide-acid substrates inhibit the lytic action but heat-killed pneumococci do not inhibit the hydrolysis. R. M. M. O.

Analysis of dog milk. G. DENIGES (Bull. Trav. Soc. Pharm., 1935, 73, 247—248; Chem. Zentr., 1936, i, 3162).—Vals. obtained for milk from two bitches were: dry matter 231, 253 fat 100, 111, lactose 27.4, 27.3, total protein 87.4, 99.2, mineral salts 13.8, 13.7, total Cl' 4.4, 4.2, acidity (phenolphthalein) 2.25, 1.98 (as lactic acid), citric acid approx. 0.3 g. per litre. A. G. P.

Composition of colostrum of dairy goats. A. J. BERGMAN and C. W. TURNER (J. Dairy Sci., 1937, 20, 37—45).—The composition of the colostrum and the recovery of normal milk composition of 6 goats over a 9-day period have been determined. All constituents except lactose decreased rapidly on the 2nd day. The secretion approaches normal milk composition on the 3rd—4th day. The globulin content of the first colostrum was 1.03—2.97%. W. L. D.

Determination of chloride in milk. A. MASSOT and H. LESTRA (Bull. Sci. pharm., 1935, 42, 523—526; Chem. Zentr., 1936, i, 3235).—To 60 c.c. of a 3:1 EtOH-COMe<sub>2</sub> mixture are added dropwise 10 c.c. of milk. The solution is made up to 100 c.c. with EtOH-COMe<sub>2</sub>, and 75 c.c. of the clear filtrate + 5 c.c. of HNO<sub>3</sub> are titrated by the Volhard method. Alternative methods are described. H. J. E.

Bile secretion. H. ISOBE (Nagoya J. Med. Sci., 1935, 9, 31—56).—Factors influencing the aq. and solid constituents of bile are examined.

CH. ABS. (p)

Blood-chlorine and gastric acidity. PAGET and DANES (J. Pharm. Chim., 1937, [viii], 25, 266—M\* (A., III.)

270).—The content of free HCl in gastric juice is not related to plasma- or corpuscle-Cl'. F. O. H.

Selective action of histamine and effect of prolonged vagal stimulation on cells of gastric glands in the dog. D. J. BOWIE and A. M. VINEBERG (Quart. J. Exp. Physiol., 1935, 25, 247—257).—Repeated subcutaneous injection of histamine did not lower the amount of pepsinogen granules (I) in peptic cells. The gastric juice produced was copious, of high acidity but low peptic power. A few hr. after administration the secretion contained no pepsin (II). Increased (II) in gastric juice following vagal stimulation coincided with discharge of (I) from the peptic cells. CH. ABS. (p)

Antipeptic influence of gastric mucin. E. A. ZAUS and L. S. FOSDICK (Amer. J. Dig. Dis. Nutr., 1934, 1, 177—178).—Commercial gastric mucin, incubated for 24 hr. at 37° in a pepsin solution, develops an increased antipeptic effect (35—48%), which may be due to hydrolysis of mucin to form a substance similar to mucoitin or chondroitinsulphuric acid.

CH. ABS. (e)

Effect of the pylorus on the secretion of acid by the fundus. C. M. WILHELMJ, F. T. O'BRIEN, and F. C. HILL (Amer. J. Physiol., 1936, 116, 685—696).—Removal of the pylorus lowers the acid secretion of the stomach > can be accounted for by the diluting and neutralising effects of the regurgitated duodenal contents. R. N. C.

Chloride and alkali content of the duodenal secretions and their relations to gastric acidity and emptying time. F. L. APPERLY and M. K. CARY (Amer. J. Physiol., 1936, 116, 337—342).—Acidity in the human stomach is reduced, chiefly by dilution, following introduction of HCl *per os*. The rate of reduction  $\propto$  the rate at which the stomach empties, and inversely  $\propto$  the concn. of neutral Cl' and alkali in the fluids that dilute the gastric contents. The concn. of alkali in the duodenum is 0—0.075N. Reduction of acidity is probably due to increased regurgitation of the duodenal contents. R. N. C.

Effects of certain acid treatments for coccidiosis on the hydrogen-ion content of the fowl intestine. W. R. KERR and R. H. COMMON (Vet. J., 1935, 91, 309—311).—Administration of buttermilk or HCl had little effect on the intestinal  $p_H$  beyond a slight increase in the small intestine with buttermilk treatment. CH. ABS. (p)

Maximum concentration of urine; its investigation and diagnostic value in renal insufficiency. M. E. VARELA (Semana med., 1935, II, 1360—1365).—With a diet rich in protein and poor in liquids normal urine has  $d$  1.030—1.040. Decreased  $d$  appears in early renal insufficiency, before non-protein in plasma has increased. A parallelism exists between deficit in concn. and elimination of phenol-sulphonethalein. CH. ABS. (p)

Bromine index of urine. B. DREVON and J. HAGOPIAN (J. Pharm. Chim., 1937, [viii], 25, 244—254).—Standard conditions for determination of the Br index (Bezssonoff *et al.*, A., 1936, 229) are recommended. The index is related to the total solids (or probably more exactly to the concn. of one or more

constituents) in the urine. Data are tabulated for the index,  $d$ , total solids, etc. of normal and vaccinated men and of guinea-pigs poisoned by  $C_6H_6$  or dinitrophenol. F. O. H.

**Determination of total carbon in urine. Modification of Dennstedt's method.** N. E. INSUA (Rev. sudamer. endocrinol., 1935, 18, 609—617).—Drying in a vac. over  $H_2SO_4$  causes a loss of C. Drying at 57—60° causes evaporation of  $COMe_2$  but no other loss. Determinations of  $COMe_2$  in the original sample and of C in the residue yield accurate results. CH. ABS. (p)

**Determination of vitamin-C in urine.** R. AMMON and K. HINSBERG (Klin. Woch., 1936, 15, 85—88; Chem. Zentr., 1936, i, 3167—3168).—The I-combining capacity of urine is partly due to reducing substances the effect of which on vitamin-C determinations may be diminished by pretreatment with KI. The indophenol method also gives high vals. The methylene-blue test gives more correct results. A. G. P.

**Ascorbic acid in urine. Methods of determination.** F. WIDENBAUER (Klin. Woch., 1936, 15, 94—95; Chem. Zentr., 1936, i, 3168).—Results of the I and indophenol methods do not agree. The former gives high vals. The latter may give a positive test in the absence of ascorbic acid. The method of Harris and Ray (A., 1935, 417) is satisfactory if determinations are made before and after heavy dosage with vitamin-C. A. G. P.

**Colorimetric determination of guanidine-like substances in urine.** J. E. ANDES and V. C. MYERS (J. Biol. Chem., 1937, 118, 137—145).—In Weber's method (A., 1928, 1048) an almost colourless extract and 85% recovery of added methylguanidine are obtained by extraction of the adsorbed material with hot EtOH-HCl. Allowance is made for the amounts of creatine (I) and creatinine (II) converted into guanidine during the adsorption; these amounts decrease as the concns. of (I) and (II) increase. In man, 3—10 mg. of guanidine-like substances are excreted in the urine in 24 hr. W. McC.

**Furan-2:5-dicarboxylic acid in urine.** B. FLASCHENTRAGER and K. BERNHARD (Z. physiol. Chem., 1937, 246, 124—132).—Human urine (but not the urine of dogs fed on rice and meat) contains per day 3—5 mg. of the acid (I), the amount not being altered when the diet is rich in carbohydrate or fat. In mixtures of (I) with hippuric acid, (I) is determined by heating the mixture with 50%  $H_2SO_4$  for 1 hr. at 120—125°, removing  $BzOH$  with steam at 180—200°, and concentrating the residue. W. McC.

**Chromatographic isolation of indirubin from urine of animals on protein-rich diets.** L. MUSAJO (Boll. Soc. ital. Biol. sperim., 1936, 11, 814—815).—The PhMe extract of the urine (rat) was fractionated with activated  $Al_2O_3$  and the appropriate zone extracted with  $C_6H_6$ . F. O. H.

**Donaggio's reaction of dog's urine.** A. LANFRANCHI and G. PACCHIONI (Boll. Soc. ital. Biol. sperim., 1936, 11, 776—777).—The urine of normal dogs gives a slight or no reaction [inhibitory pheno-

menon or capacity to prevent pptn. of thionine by  $NH_4$  molybdate (Donaggio, *ibid.*, 1933, 8, 1456—1459)]; that of diseased dogs gives a reaction partly related to the protein content. F. O. H.

**Donaggio's reaction of immunising preparations and bacterial suspensions.** A. LANFRANCHI and C. FORESTI (Boll. Soc. ital. Biol. sperim., 1936, 11, 777—778; cf. preceding abstract).—Vaccines give a positive reaction but to varying extents, whilst suspensions of bacteria (of dilution corresponding with the vaccines) invariably give negative vals. F. O. H.

**Donaggio's reaction in inoculation vaccines.** S. COLOMBATI (Boll. Soc. ital. Biol. sperim., 1936, 11, 780—782).—The urine (normally negative) of infants gives a positive reaction (cf. preceding abstract) 2 hr. after inoculation and persisting for approx. 15 days. F. O. H.

**Determination of antimony in excreta.** J. COUILLAUD (Bull. Trav. Soc. Pharm., 1935, 73, 248—250; Chem. Zentr., 1936, i, 3189).—Urine and faeces are destroyed by  $HNO_3 + H_2SO_4$ ,  $Cl^-$  in urine being first pptd. with  $AgNO_3$ . The solution is neutralised and brought to a definite acidity by adding  $Na_2B_4O_7 +$  a measured amount of  $HCl +$  tartaric acid.  $H_2S$  is passed and 1—3 drops of 1% aq.  $BaCl_2$  are added. Sb is determined by comparing the colour of the ppt. with that from known amounts of Sb. J. S. A.

**Acetone content of urine, faeces, and organs of dogs after administration of isopropyl alcohol.** H. KEMAL (Z. physiol. Chem., 1937, 246, 59—63; cf. A., 1927, 990).—Methods are given for the determination of  $COMe_2$  in presence of  $Pr^oOH$  in urine, faeces, and organs and results of the administration of  $Pr^oOH$  to dogs are recorded. H. W.

**Effect of bile on the excretion of sterol in the faeces.** A. SHAPIRO and H. KOSTER (Amer. J. Physiol., 1936, 116, 317—321).—Operative exclusion of bile from the intestines of patients causes a fall in faecal sterol excretion. The higher cholesterol content of human bile may explain the variation from previous observations in dogs. R. N. C.

**Absence of pterins from the excrement of insects which produce them.** E. BECKER (Z. physiol. Chem., 1937, 246, 177—180; cf. Schopf and Wieland, A., 1926, 1168; 1936, 1260).—The excrement of the freshly hatched hornet *Vespa crabro* and of the butterfly *Gonepteryx rhamni* contain no xanthopterin (I) or leucopterin although (I) occurs in the folds of the integument of the hornet and on the wings of the butterfly. W. McC.

**Physicochemical investigations of human sweat.** G. HOPE (Arch. Dermatol. Syph., 1935, 171, 301—312).—The  $p_H$  of perspiration induced by heat varied with the diet and the alkali reserve of the individual, but followed these less closely than did urinary  $p_H$ .  $[Na^+]$  and  $[Cl^-]$  in perspiration increased but  $[K^+]$ ,  $[Ca^{++}]$ , and  $[Mg^{++}]$  decreased as treatment progressed. CH. ABS. (p)

**Gastric acidity in acne vulgaris: consideration of normal gastric acidity.** S. L. IMMERMAN (Arch. Dermatol. Syphilol., 1935, 31, 343—347).—In acne vulgaris there was no evidence of hypoacidity

or of any relation between gastric acidity, hæmoglobin content, and red cell count. CH. ABS. (p)

**Acne and furunculosis. Treatment with physiological sodium chloride, locally or by intravenous injection.** H. GOODMAN (Arch. Dermatol. Syphilol., 1935, 31, 828—830).—Therapeutic action of NaCl may be due to lowering of blood-sugar. Growth of streptococci and staphylococci is inhibited by 2—3% aq. NaCl. CH. ABS. (p)

**Intake of potassium, an important consideration in Addison's disease.** R. M. WILDER, E. C. KENDALL, A. M. SNELL, E. J. KEPLER, E. H. R. ARSON, and M. ADAMS (Arch. Int. Med., 1937, 59, 367—393).—Restriction of K from 4 (that of a normal diet) to 1.6 g. per day lowers the requirement of NaCl if no injection of adrenal cortex is given. On such a diet supplements of  $\text{Ca}_3(\text{PO}_4)_2$ , Fe, and vitamin-B<sub>1</sub> and -B<sub>2</sub> are required. H. G. R.

**Action of the adrenal extract, Cortidyn, in Addison's disease.** G. ARNDT (Fortschr. Ther., 1935, 11, 641—652; Chem. Zentr., 1936, i, 2964).—Cortidyn stimulated the action of adrenaline in increasing blood-sugar. A. G. P.

**Ferrous gluconate and its use in treatment of hypochromic anæmia in rats.** P. REZNIKOFF and W. F. GOEBEL (J. Pharm. Exp. Ther., 1937, 59, 182—192).— $\text{Fe}^{II}$  gluconate,  $(\text{C}_6\text{H}_{11}\text{O}_7)_2\text{Fe}\cdot\text{H}_2\text{O}$ ,  $[\alpha]_D^{20} +3.5^\circ$  in  $\text{H}_2\text{O}$  (from Ba gluconate and  $\text{FeSO}_4$  in  $\text{N}_2$ ), when fed to or injected intramuscularly into anæmic rats, causes a rapid and marked increase in reticulocytes, red cells, and hæmoglobin. J. N. A.

**Blood-urea in cattle with Aujeszky's disease.** P. ROSSI (Compt. rend. Soc. Biol., 1937, 124, 706—707).—Blood-urea rapidly increases, the excretion of urea being normal. Blood-Cl is unchanged. H. G. R.

**Experimental investigation of "aniline cancer."** I. BERENBLUM and G. M. BONSER (J. Ind. Hyg., 1937, 19, 86—92).—Intraperitoneal injections in rabbits and oral administration to rats of benzidine,  $\alpha$ - and  $\beta$ - $\text{C}_{10}\text{H}_7\text{NH}_2$ ,  $\text{NH}_2\text{Ph}$ , and 5-chloro-*o*-toluidine failed to produce tumours in the animals. Extracts of urine from employees in the  $\text{NH}_2\text{Ph}$  industry had no carcinogenic action on the skin of mice. A. L.

**Variation in the hyperglycæmia during the proliferation of a grafted tumour.** J. LOISELEUR and W. NYKA (Compt. rend. Soc. Biol., 1937, 124, 701—703).—The blood-sugar curve (in rabbits) is similar to that obtained after artificial histolysis and does not depend on the effect of the grafting. H. G. R.

**Milk preventing mottled enamel in teeth.** J. A. TOBEX (Milk Plant Month., 1937, 26, No. 1, 30—32).—Mottled enamel is caused by too much F or too little Ca in the diet. When milk replaces F-containing drinking- $\text{H}_2\text{O}$  to a larger extent the additional Ca prevents excessive absorption of toxic fluorides. W. L. D.

**Blood-sugar of dogs during experimental cholæmia.** E. CHABROL, J. COTTET, and J. SALLET (Compt. rend. Soc. Biol., 1937, 124, 719—720).—No variation in the blood-sugar was observed. H. G. R.

**Effect of experimental cholæmia [in dogs] on adrenaline hyperglycæmia.** E. CHABROL, J. COTTET, and J. SALLET (Compt. rend. Soc. Biol., 1937, 124, 720—721).—The hyperglycæmia is considerably reduced. H. G. R.

**Diet of diabetics prior to the onset of the disease.** H. P. HIMSWORTH (Clin. Sci., 1935, 2, No. 1, 95—116).—The majority of diabetics had preferred a high-fat diet of high calorific val. Habitual ingestion of low-carbohydrate diets may cause progressive impairment of sugar tolerance and insulin-sensitivity resulting in diabetes. CH. ABS. (p)

**Diet and the incidence of diabetes mellitus.** H. P. HIMSWORTH (Clin. Sci., 1935, 2, No. 1, 117—148).—Incidence of diabetes was high in countries with a high-fat low-carbohydrate diet. Calorific vals. of diets and consumption of excess of sugar and EtOH were not contributory factors. CH. ABS. (p)

**Influence of pathological skin conditions on experimental hyperketonæmia.** A. MIDANA and L. D. GRANDE (Arch. Dermatol. Syph., 1935, 171, 208—222).—High correlation is shown between the area of skin involved in dermatoses and the degree of hyperketonæmia.  $\beta$ -Hydroxybutyric acid caused the greatest increase in ketones. CH. ABS. (p)

**Use of maize oil (unsaturated acids) in treatment of eczema.** T. CORNBLEET and E. R. PACE (Arch. Dermatol. Syphilol., 1935, 31, 224—226).—Curative effects are reported. Eczema is possibly related to the unsaturated fatty acid level of the blood. CH. ABS. (p)

**Dinitrophenol in treatment of ichthyosis.** M. MOLITCH and R. F. COUSINS (Arch. Dermatol. Syphilol., 1935, 32, 466—467).—Oral administration of dinitrophenol failed to produce loss of wt. but increased basal metabolism without affecting temp., blood count, blood-sugar or -urea. CH. ABS. (p)

**Low-calorie, low-fat, ketogenic diet for treatment of infections of the urinary tract.** R. M. NESBIT and C. H. McDONNELL (J. Amer. Med. Assoc., 1935, 105, 1183—1184).—The diet, supplying protein 0.66, carbohydrate (no sugar) 0.33 g. per kg. body-wt., induced ketosis without gastric disturbance. Ketosis depends on inadequacy of available glucose and not on the amount of fat ingested. CH. ABS. (p)

**Calcium : protein ratio in hyperproteinæmia. Total diffusible serum-calcium in lymphogranuloma inguinale and myeloma.** A. B. GUTMAN and E. B. GUTMAN (Proc. Soc. Exp. Biol. Med., 1936, 35, 511—515).—In sera of high protein content the  $[\text{Ca}]$  usually remains normal even when the  $[\text{PO}_4^{'''}]$  is not high. High Ca contents such as are encountered in multiple myeloma are probably due to destruction of bone by neoplastic tissue, the ratio diffusible Ca : total Ca remaining approx. const. Increased protein-bound Ca is probably united to albumin and to a small extent to euglobulin. W. McC.

**Alimentary cholesterolaemia in animals with hepatic lesions.** M. PISA and B. L. DELLA VIDA (Boll. Soc. ital. Biol. sperim., 1936, 11, 904—907).—Ingestion of cholesterol (I) by rabbits with hepatic

lesions (P poisoning) produces vals. of liver-(I) >, and changes in blood-(I) different from, those of normal rabbits. F. O. H.

**Blood reagent for serum-flocculation in malaria.** F. X. HENRY (Compt. rend. Soc. Biol., 1937, 124, 795—796).—The prep., by slow oxidation of hamatin hydrochloride, of a reagent for use in this reaction is described. H. G. R.

**Reliability of clearance tests for renal efficiency.** C. L. COPE (Clin. Sci., 1935, 2, No. 1, 35—42).—In tests of nephritis, blood and urine are analysed after oral administration of urea 15, creatinine 3, or xylose 30—50 g. CH. ABS. (p)

**Biochemistry of scalding and traumatic shock.** VII. Ascorbic acid content of adrenal glands. G. STOLFI (Boll. Soc. ital. Biol. sperim., 1936, 11, 918).—The content in rabbits is reduced by scalding and, to a smaller extent, by traumatic shock. F. O. H.

**Role of iodine in the therapy of syphilis: relation to lipins.** E. T. BURKE (Arch. Dermatol. Syphilol., 1935, 32, 404—412).—Although I has no spirochæticidal val. it should accompany As or Bi therapy in order to iodinate unsaturated lipins which prevent lymphocytic enzymes from exerting a spirochæticidal action. CH. ABS. (p)

**Blood-cholesterol in the preagonic period of tuberculosis.** I. R. STEINBERG (Semana méd., 1935, II, 1225—1228).—Increased blood-cholesterol in the terminal stage of tuberculosis is exceptional. CH. ABS. (p)

**Elimination of ascorbic acid in tubercular animals.** G. SCOZ (Boll. Soc. ital. Biol. sperim., 1936, 11, 908—909).—Prolonged administration of vitamin-C is necessary in tubercular patients before excretion of -C occurs, indicating avitaminosis-C. Incidence of fever and general debility is accompanied by increased excretion of -C. F. O. H.

**Avitaminosis-C and experimental tubercular infection.** G. SCOZ and C. CATTANEO (Boll. Soc. ital. Biol. sperim., 1936, 11, 909—911).—The diminished rate of growth of guinea-pigs due to avitaminosis-C is accompanied by increased susceptibility to tubercular infection. F. O. H.

**Gastric ulcer formation by bile acid salt.** M. YOSHITOMI (Fukwoka-Ik.-Zasshi, 1935, 28, 406—414).—The ulcer-forming action of bile acid is closely related to the acidity of the gastric juice; its action is inhibited by lecithin. CH. ABS. (p)

**Progress of dairy science. A. Physiology of dairy cattle. I. Reproduction and lactation.** J. A. B. SMITH. II. Nutrition. S. MORRIS (J. Dairy Res., 1937, 8, 105—118, 119—131).—Biennial reviews. W. L. D.

**p<sub>H</sub> changes of muscle during and after contraction.** M. DUBUISSON (Proc. Soc. Exp. Biol. Med., 1937, 35, 609—611).—Changes of p<sub>H</sub> during and after muscular contraction can be rapidly recorded ( $\frac{1}{2}$  sec.) by a method based on the fact that CO<sub>2</sub> passes freely across the muscle membrane, whilst other buffer substances are more slowly exchanged. P. G. M.

**Living cell. Physical properties and micro-chemical reactions.** R. CHAMBERS, M. J. KOPAC, and C. G. GRAND (Ind. Eng. Chem. [Anal.], 1937, 9, 143—145).—Technique for studying reactions in living cells is described. E. S. H.

**Oxidation-reduction mechanism in the [living] cell.** R. H. DE MEIO (Anal. Asoc. Quím. Argentina, 1936, 24, 73—89).—A review. F. R. G.

**Respiratory quotients of normal and neoplastic tissues.** A. H. ROFFO and L. M. CORREA (Rev. soc. Argentina biol., 1935, 11, 202—209).—The R.Q. of growing chick heart averaged 0.86; that of rat sarcoma and carcinoma, 1.31. CH. ABS. (p)

**Intrinsic and extrinsic respiratory oxidation.** L. PLANTEFOL (Compt. rend., 1937, 204, 370—372).—Respiratory oxidations strictly associated with vital processes are termed intrinsic whilst those of an interfacial type and independent of vital processes are termed extrinsic oxidations. The former type is illustrated by the changes in respiration of *Hypnum triquetrum* on immersion in aq. NaNO<sub>3</sub> or glucose.

**Consumption of oxygen by central [nervous] preparations.** A. GALAMINI and E. FALVO (Boll. Soc. ital. Biol. sperim., 1936, 11, 894—896).—The O<sub>2</sub> consumption of preps. of the central nervous system of *Bufo vulgaris* is increased by trauma and either inhibited or, following the accumulation of the products of oxidative catabolism, increased by Et<sub>2</sub>O narcosis. F. O. H.

**Effect of lead on tissue metabolism.** D. DOLOWITZ, J. F. FAZEKAS, and H. E. HIMWICH (J. Ind. Hyg., 1937, 19, 93—94).—5 mg. of Pb [as Pb(OAc)<sub>2</sub>] per 100 mg. of tissue decreased O<sub>2</sub> consumption of brain, kidney, liver, and testis tissue *in vitro*. Glycolysis and dehydrogenation were inhibited in brain tissue. A. L.

**Effect of dinitrophenol and dinitrocresol on the oxygen consumption of diapause and developing embryos.** J. H. BODINE and E. J. BOELL (Proc. Soc. Exp. Biol. Med., 1936, 35, 504—506).—The O<sub>2</sub> uptake of diapause and developing grasshopper embryos (*Melanoplus differentialis*) is increased by addition to the medium of dinitro-phenol (I) or -cresol, the max. effect being attained at concns. of  $2.5 \times 10^{-5}$  and  $1 \times 10^{-5}M$ , respectively. CO inhibits the action of (I) on developing embryos but only slightly diminishes that on diapause embryos. KCN restricts or inhibits the action of (I) according to the concn. used. W. McC.

**Inositol and the respiration of brain.** L. YOUNG (Proc. Soc. Exp. Biol. Med., 1936, 35, 507—510).—The respiration of brain (rat, rabbit) is not affected by addition of inositol. (Cf. Das and Guha, A., 1935, 658.) W. McC.

**Ratio of the feather- to body-weights [of chicken]. Chemical constitution.** R. SALGUES (Compt. rend. Soc. Biol., 1937, 124, 819—821).—The ratio decreases with age and with increasing wt. of the species and is independent of the food. With increasing age, the H<sub>2</sub>O and fat contents of the feathers diminish whilst that of protein increases. H. G. R.

**Heat rigor of avian muscle.** H. LOEBENSTEIN (Pflüger's Archiv, 1936, 238, 113—123).—The rigor develops in two stages of which the second is much more marked than the first. As avian muscle contains much more myogen than myosin the results support the coagulation theory of heat rigor, which is briefly discussed. M. A. B.

**Synthesis of protein and amino-acids in mice with the aid of deuterium.** J. A. STEKOL and W. H. HAMILL (Proc. Soc. Exp. Biol. Med., 1937, 35, 591—593).—Analysis of protein,  $\text{NH}_2$ -acids, etc. of mice receiving 2% of  $\text{D}_2\text{O}$  in their diet indicates that these contain D in non-labile form. P. G. M.

**Selection in the biological synthesis of lecithins and kephalins in brain.** K. P. McCONNELL and R. G. SINCLAIR (J. Biol. Chem., 1937, 118, 131—136; cf. A., 1936, 1283).—The elaidic acid content of the fatty acids in the lecithin and kephalin of the brain of rats supplied with large amounts of elaidin is only about 25% of that of their liver and muscle. Hence there appears to be greater selection in the building up of the phospholipins of brain than with those of liver and muscle. W. McC.

**Phospholipin metabolism of tumours.** F. L. HAVEN (J. Biol. Chem., 1937, 118, 111—121).—In young rats on a diet containing 70% of elaidin, the elaidic acid (I) content of implanted tumours reaches approx. 20% of the total phospholipin-fatty acid content. (I) enters and disappears from the tumours more slowly than occurs with liver. The phospholipins (II) of tumour serve chiefly for cell building. In the tumours the ratio of the saturated to the unsaturated fatty acids of (II) equals that (3 : 7) for rat's muscle-(II). W. McC.

**Lipin metabolism of the hypophysectomised dog and the lipin and carbohydrate metabolism of the hypophysectomised-depancreatized dog.** I. L. CHAIKOFF, G. E. GIBBS, G. F. HOLTRON, and F. L. REICHERT (Amer. J. Physiol., 1936, 116, 543—550).—The various lipin (I) constituents of the blood generally remain normal after hypophysectomy, although total (I) is sometimes increased. Liver-(I) constituents remain normal in absence of all pituitary tissue. Complete hypophysectomy does not prevent (I) accumulation in the liver after pancreatectomy. R. N. C.

**Fat feeding and cholesterol absorption.** R. P. COOK (Biochem. J., 1937, 31, 410—415).—With rats fed on diets containing 15, 20, and 30% of fat with and without 2% of cholesterol (I), (I) has a deleterious effect on growth, especially with the lowest intake of fat. The absorption of (I) is not  $\propto$  the intake of fat. (I), which is conc. in the liver, appears to be metabolised to the extent of approx. 30%; this is most marked with diets containing 15% of fat. F. O. H.

**Fat and lipin metabolism in dogs with Eck fistulæ.** L. KESZTYUS and J. MARTIN (Biochem. Z., 1937, 289, 341—347).—The hypolipæmia which succeeds the hyperlipæmia produced by giving dogs large doses of olive oil or olive oil + cholesterol (I) does not occur in dogs with Eck fistulæ. The free

(I) of the blood is greatly increased by oil in normal dogs but is scarcely affected in dogs with fistulæ.

W. McC.

**Passage of elaidic acid through the placenta and into the milk of the rat.** K. P. McCONNELL and R. G. SINCLAIR (J. Biol. Chem., 1937, 118, 123—129).—The elaidic acid (I) content of new-born rats constitutes 11% of their total phospholipin-fatty acids (II) and the (I) content of their liver constitutes 16% of its (II) content when the mothers receive a diet rich in elaidin. If the young are allowed to suckle, their (I) content reaches 61% of the total (II) after 10 days and after 3 weeks the (I) content of the liver constitutes 27% of its (II) content. Hence (I) passes through the placenta and into the milk. W. McC.

**Oxidation of fatty acids by "fatty" liver.** L. CALIFANO (Biochem. Z., 1937, 289, 354—364).—The rate of oxidation of saturated fatty acids by the livers of rats and guinea-pigs is reduced by poisoning the animals with P. With crotonic acid, P poisoning causes only very slight reduction in the rate, whilst  $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$  production remains almost normal. The livers oxidise dicarboxylic acids at different (but < normal) rates (succinic > sebacic > suberic > azelaic), keto-acid production being reduced. Glutaric acid is not oxidised. W. McC.

**Effect of the liver in the formation and destruction of bile salts.** J. L. BOLLMAN and F. C. MANN (Amer. J. Physiol., 1936, 116, 214—224).—Bile salts (I) are present only in traces in the urine, and undetectable in the blood, of the normal dog. Intravenous injection or continuous infusion of (I) results in appearance of only traces in the urine and faeces. After complete removal of the liver, (I) are not found in blood or urine, and when injected are excreted quantitatively in 12 hr. In animals with biliary obstruction only part of the (I) are excreted. The liver is apparently the site of formation and concerned in the destruction of (I). Hepatotoxins such as  $\text{CCl}_4$ ,  $\text{CHCl}_3$ , or  $\text{C}_2\text{H}_2\text{Cl}_4$  inhibit formation but scarcely affect destruction of (I); other toxins are without effect. R. N. C.

**Mercapturic acid synthesis in animals. III. Relation between time of administration of food and of bromobenzene and extent of p-bromophenylmercapturic acid synthesis in dogs.** J. A. STEKOL [with J. R. FOY] (J. Biol. Chem., 1937, 118, 155—160; cf. this vol., 91).—Since in well-fed dogs the extent of synthesis of p-bromophenylmercapturic acid from dietary PhBr is independent of the time of giving the food or the PhBr, it appears that dietary S is not the immediate source of the S utilised in the detoxication of PhBr. W. McC.

**Metabolism of S-carboxymethylcysteine. Use in therapy of cystinuria and relation to methionine : cysteine ratio.** E. BRAND, R. J. BLOCK, B. KASSELL, and G. F. CAHILL (Proc. Soc. Exp. Biol. Med., 1936, 35, 501—503).—Following the administration of the compound (I) to a healthy person no cystine (II) or  $\cdot\text{SH}$  compound is found in the urine, 40% of the S of (I) being partly oxidised and the remainder being converted into an  $\cdot\text{S}\cdot\text{S}\cdot$  compound (possibly a derivative of dithodiglycollic acid). In

cystinurics 15% of the S of (I) was excreted as inorg.  $\text{SO}_4^{''}$  and the remainder as neutral S [ $\cdot\text{S}\cdot\text{S}\cdot$  compound and unchanged (I)]. The excretion of (II) by the cystinurics decreased greatly after (I) was given.

W. McC.

Participation of ornithine, citrulline, and arginine in the normal process of urea formation in the liver, using angiotomy. II. E. S. LONDON and A. K. ALEXANDRY (Z. physiol. Chem., 1937, 246, 106—112; cf. A., 1934, 1392).—Ornithine has no appreciable effect on the separation of urea from the liver and does not accelerate its formation when used as an addition to  $\text{NH}_4\text{Cl}$ . Citrulline has no marked action whereas arginine causes increase in the separation of urea in a manner differing from that of  $\text{NH}_4\text{Cl}$ . The experiments do not support Krebs' hypothesis of the mode of formation of urea.

H. W.

Urea clearance of rats : its technique and normal range. L. E. FARR and J. E. SMADEL (Amer. J. Physiol., 1936, 116, 349—357).—The mean clearance on a milk diet is 10.9 c.c. per sq. m. of body-surface per min., the standard deviation being  $\pm 3.1$  c.c. A method of determination is described.

R. N. C.

Glycogen formation after alanine administration in adrenalectomised animals. L. T. SAMUELS, J. S. BUTTS, H. F. SCHOTT, and H. A. BALL (Proc. Soc. Exp. Biol. Med., 1937, 35, 538—539).—Adrenalectomy interferes with the metabolism of alanine (administered *per os*) to glycogen in both male and female rats.

P. G. M.

Relationship between gastric administration of glucose and the hyperglycæmia produced. R. TOAFF (Arch. Farm. speriment., 1936, 62, 227—234).—Following administration of 1—12 g. of glucose per kg. body-wt. into the stomachs of fasting (12 hr.) rabbits, the dose of 6 g. per kg. produces the most gradual and regular hyperglycæmia, the max. val. of which, however, is produced by that of 4 g. per kg.

F. O. H.

Effect of adrenaline and of increased work on the carbohydrate metabolism of the mammalian heart. J. L. BOGUE, C. L. EVANS, F. GRANDE, and F. Y. HSU (Quart. J. Exp. Physiol., 1935, 25, 213—228).—Increased energy expenditure of the dog's heart by means of adrenaline or by mechanical work increases the utilisation of sugar and of lactate. Lactate is used more readily by cardiac than by skeletal muscle and is probably consumed to yield energy. Sugar serves to replace glycogen usage. When blood-sugar and -lactate have reached a low level heart-glycogen is drawn on to supply energy.

CH. ABS. (p)

Carbohydrate metabolism in the depancreatized dog. S. B. BARKER, W. H. CHAMBERS, and M. DANN (J. Biol. Chem., 1937, 118, 177—195).—Glucose (I) (16—50 g.) administered to depancreatized dogs during the early and intermediate stages of inanition does not increase the R.Q., has no ketolytic or N-sparing effect, and is recovered in the urine to the extent of 95%. Hence no oxidation of (I) occurs during these stages. In the later stages of inanition, ketolytic and N-sparing effects appear, creatinuria

increases, and the proportion of (I) recovered in the urine is greatly diminished, indicating oxidation of (I).

W. McC.

Production of phosphoric esters in the intestinal mucous membrane during absorption. F. VERZAR and H. SÜLLMANN (Biochem. Z., 1937, 289, 323—340).—The acid-sol. org.  $\text{PO}_4^{'''}$  content of the membrane in fasting rats is increased by administration of sugars [fructose (I) > galactose (II) > glucose (III) > mannose (IV)] and glycerol. The phosphoric esters produced after giving (I) are more readily hydrolysed by acid than are those produced after (II), (III), or (IV). Following adrenalectomy, the content is increased by (I) and (III) and, after poisoning with  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ , by (I) (slightly) but not by (III). Administration of (I) after adrenalectomy and  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  poisoning causes production of phosphoric esters as easily hydrolysed as are those produced in normal rats after giving (I).

W. McC.

Phosphoglyceric acid as carrier of blood-phosphorus and its behaviour in experimental ammonium chloride acidosis. I. II. S. RAPAPORT (Biochem. Z., 1937, 289, 411—415, 416—419).—I. The decrease in the diphosphoglyceric acid (I) content of blood following administration of  $\text{NH}_4\text{Cl}$  accounts for the total P decrease. (I), which is probably rapidly produced (with monophosphoglyceric acid as intermediary) after  $\text{NH}_4\text{Cl}$  administration ceases, seems to act as P carrier in blood.

II. The (I) content of erythrocytes, decreased by administration of  $\text{NH}_4\text{Cl}$ , is rapidly restored to the normal level by oral administration of  $\text{NaH}_2\text{PO}_4 + \text{Na}_2\text{HPO}_4$ .

W. McC.

Biological degradation of hydrogen esters. II. K. BERNHARD (Z. physiol. Chem., 1937, 246, 133—138; cf. A., 1936, 886).—In dogs subcutaneously injected Et H adipate, suberate (I), azelate (II), b.p. 185—195°/11 mm., sebacate (III), and Me H sebacate (IV) are more extensively (20—30%) oxidised than are the corresponding free acids. Succinic acid and Et H succinate are completely oxidised. After injection of (II), the urine contains some pimelic acid, after (IV) suberic acid (V), and after (III) (I), (V), and adipic acid. The degree of oxidation depends only in part on the length of the C chain.

W. McC.

Physiological degradation of citric acid. C. MARTIUS and F. KNOOP (Z. physiol. Chem., 1937, 246, I—II).—The hypothesis of the formation of  $\text{CO}(\text{CH}_2\cdot\text{CO}_2\text{H})_2$  and  $\text{CO}_2$  in the degradation of citric acid (I) is without physiological analogy. The scheme,  $(\text{I}) \rightarrow \text{CO}_2\text{H}\cdot\text{CH}\cdot\text{C}(\text{CO}_2\text{H})\cdot\text{CH}_2\cdot\text{CO}_2\text{H} \rightarrow [\text{CO}_2\text{H}\cdot\text{CH}(\text{OH})\cdot\text{CH}(\text{CO}_2\text{H})\cdot\text{CH}_2\cdot\text{CO}_2\text{H}] \rightarrow \text{CO}_2\text{H}\cdot\text{CO}\cdot\text{CH}(\text{CO}_2\text{H})\cdot\text{CH}_2\cdot\text{CO}_2\text{H}$  is supported by the isolation of  $\alpha$ -ketoglutaric acid as dinitrophenylhydrazine from the product of the action of liver dehydrogenase on (I).

H. W.

Acetoacetic acid and the kidney. A. ROSSI and L. GIUFFRÈ (Boll. Soc. ital. Biol. speriment., 1936, 11, 938—940).— $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$  is decomposed to the extent of 75% by kidney slices in Ringer's solution and  $\text{O}_2 + \text{CO}_2$  with formation of  $\beta$ -hydroxybutyric acid (28%),  $\text{COMe}_2$  (6%), and unknown products (41%).

F. O. H.

**Diffusion of (A) lactic acid, (B) iodide, into and out of voluntary muscles of the frog.** A. GHAFAR (Quart. J. Exp. Physiol., 1935, 25, 229—239, 241—245).—(A) About 1/3 of the muscle- $H_2O$  was concerned in the diffusion of Na  $\alpha$ -lactate (I) into resting muscle in Ringer solution; the remainder is probably enclosed in membranes impermeable to (I). Two portions of muscle, "interspaces" and "cells" respectively, are distinguished. In fatigued muscle "interspaces" disappear through swelling of "cells." In heat rigor nearly all  $H_2O$  is available for the diffusion process. Excitation of isolated muscle did not increase the permeability of "cell" membranes. Lactic acid content of "cells" is < that of "interspaces," irrespective of the condition of the muscle, and variation in the two consens. are parallel.

(B) Similar results were obtained with NaI.

CH. ABS. (p)

**Role of heavy metals in animal metabolism.** J. R. E. RICHARDSON (Guy's Hosp. Gaz., 1935, 49, 239—241).—Spectroscopic determination of Na, K, Ca, Mg, Fe, Zn, Cu, Mn, Al, Rb, and Sn is considered.

CH. ABS. (p)

**Availability of iron in wheat.** A. H. FREE and F. C. BING (Proc. Soc. Exp. Biol. Med., 1936, 35, 453—454).—Hard spring and soft winter wheat contain 2.9—4.87 mg. of total Fe (2.46—4.04 mg. of inorg. Fe) per 100 g. Practically all of the Fe is available to rats.

W. McC.

**Calcium and phosphorus metabolism in osteomalacia. VI. Lactation and beneficial action of vitamin-D.** S. H. LIU, C. C. SU, C. W. WANG, and K. P. CHANG (Chinese J. Physiol., 1937, 11, 271—293).—With low Ca intake, the secretion of milk is decreased. Administration of vitamin-D assures a positive Ca balance even if the Ca ingestion is low but with abundant milk supply both Ca and -D are necessary.

H. G. R.

**Excretion of radio-sodium following intravenous administration in man.** J. G. HAMILTON and R. S. STONE (Proc. Soc. Exp. Biol. Med., 1937, 35, 595—598).—Radio-Na was administered intravenously to two leucæmic subjects. A large proportion was excreted in one subject in the sweat, and in the other in the urine. It could not be detected in the faeces.

P. G. M.

**Can injected sulphur be utilised by the animal organism?** R. W. VIRTUE and H. H. BEARD (Proc. Soc. Exp. Biol. Med., 1937, 35, 605—606).—12 mg. of colloidal S in oil was injected intraperitoneally in rats. It was not utilised either for growth or cystine production.

P. G. M.

**p-Bromophenylmercapturic acid and ethereal sulphate synthesis in dogs maintained on diets of varying sulphur content.** J. A. STEKOL (Proc. Soc. Exp. Biol. Med., 1937, 35, 623—627).—Deprivation of dietary S decreases the output of mercapturic acid and increases that of ethereal sulphates following the feeding of PhBr.

P. G. M.

**Behaviour of sodium in the working mammalian muscle.** G. MALORNY and H. NETTER (Pflüger's Archiv, 1936, 238, 153—167).—Na in rabbit muscle may be increased by 100% by continued rhythmical

stimulation. The Na is taken up from the blood, which even after disappearance of the lactic acid (I) shows low Na and  $HCO_3'$  vals. Intravenous injection of (I) caused a similar increase in muscle-Na. This base-fixation lessens the alkalosis occurring during recovery. When (I) is oxidised the  $CO_2$  produced and available for neutralisation of the liberated Na is only about half that originally displaced by (I).

M. A. B.

**Effect of suckling on the galactin content of the pituitary of the rat.** R. P. REECE and C. W. TURNER (Proc. Soc. Exp. Biol. Med., 1936, 35, 367—368).—The galactin content is greatly decreased by removing the milk from the mammary gland by suckling or otherwise.

W. McC.

**Effect of stimulus of suckling on galactin content of the rat pituitary.** R. P. REECE and C. W. TURNER (Proc. Soc. Exp. Biol. Med., 1937, 35, 621—622).—Suckling decreases the galactin content of the rat pituitary, irrespective of removal of milk.

P. G. M.

**Influence of radioactive waters on the resistance of animals to chloral hydrate narcosis.** C. KUCERA (Sborn. czechoslov. Akad. Zemed., 1935, 10, 553—559; Chem. Zentr., 1936, i, 3170).—Radioactive  $H_2O$  increases the resistance to narcosis.

A. G. P.

**Effect of Röntgen rays on lipins of the epidermis.** U. J. WILE, O. J. CAMERON, and H. C. ECKSTEIN (Arch. Dermatol. Syphilol., 1935, 32, 69—72).—Irradiation of skin after death caused a loss of cholesterol, phospholipins, and total lipins.

CH. ABS. (p)

**Effect of X-irradiation on the iodine content of thyroid gland.** G. BECCHINI and A. CARTENI (Boll. Soc. ital. Biol. sperim., 1936, 11, 945—948).—The thyroid-I in dogs (normally 0.05—0.06%) is increased by -irradiation followed by injection of KI to an extent > the added effects of irradiation and injection alone. This evidence of a modified thyroid activity is supported by the changes in I excretion.

F. O. H.

**Effect of infra-red irradiation on disintegration of homologous proteins injected into the guinea-pig.** P. E. MARTIN and P. PLAN (Compt. rend. Soc. Biol., 1937, 124, 774—776).—The polypeptidæmia after injection of a homologous protein is considerably decreased by infra-red irradiation.

H. G. R.

**Mechanism of death in unicellular organisms. I. Delayed death and change in resistance to ultra-violet radiation in *Paramecium bursaria* with age of culture.** P. S. TANG and H. Z. GAW (Chinese J. Physiol., 1937, 11, 305—314).—The lethal action of ultra-violet light is delayed so that some cells do not die for some time after the irradiation. The resistance of the cell decreases with age of the culture.

H. G. R.

**Mechanism of the action of ultra-violet light.** G. GALLERANI (Boll. Soc. ital. Biol. sperim., 1936, 11, 817—818).—Irradiation of albumin (in Ringer's solution), serum, aq. colloid preps., aq. electrolytes, or rabbit's muscle *in vivo* produces a flow of electrons or negatively charged ions in the medium.

F. O. H.

**Effect of solar irradiation of pregnant rats on the calcium, phosphorus, and phosphatase contents of the foetus.** P. FOÀ (Boll. Soc. ital. Biol. sperim., 1936, 11, 845—847).—Exposure of rats to sunlight (compared with ordinary daylight) increased the P and Ca contents of the foetuses by approx. 20%, the phosphatase content remaining unchanged. The effect is attributed to increase in the maternal stores of vitamin-D. F. O. H.

**Reid's experiment.** P. J. JURISIĆ (Pflüger's Archiv, 1936, 238, 103—106).—Frog skin sacs filled with, and dipping into, Ringer's solution can show an increase in wt. even after the membrane is dead or has lost most of its vitality. Probably  $H_2O$  transport is not due to vital activity. Previously observed  $H_2O$  transport against gravity in collodion membranes may be due to swelling of the membrane. M. A. B.

**Response of skeletal muscle to changes in hydrogen-ion concentration.** I. P. CHAO (Chinese J. Physiol., 1936, 11, 225—236).—With sub-maximal stimulation, the  $p_H$  for the optimum response is 5.8—6.9 when the rheobase, but not the chronaxie, is a min. As the stimulation approaches a max., the optimum  $p_H$  shifts towards the alkaline side. H. G. R.

**Influence of electrolyte content of muscular contractility, irritability, and neuro-muscular transmission.** I. P. CHAO (Chinese J. Physiol., 1937, 11, 237—245).—The contractility of muscle is decreased with a decrease in the NaCl content of the Ringer's solution. The muscle remains irritable for a longer period in a sucrose solution with KCl and  $CaCl_2$  than in the absence of electrolytes. H. G. R.

**Osmotic properties of isolated amphibian skeletal muscle.** I. P. CHAO and K. T. CHEN (Chinese J. Physiol., 1937, 11, 253—268).—The wt. of an isolated muscle obeys the Boyle-van't Hoff law in relation to the osmotic pressure of the surrounding medium. The osmotically inactive material of the muscle increases after dissection and the active fraction decreases with time of immersion, whilst both may be affected in an unbalanced medium. H. G. R.

**Exchange of salt and water between muscle and blood. II. Effect of respiratory alkalosis and acidosis induced by overbreathing and rebreathing.** L. EICHELBERGER and A. B. HASTINGS [with N. TUPIKOVA] (J. Biol. Chem., 1937, 118, 197—204; cf. this vol., 87).—In dogs the alkalosis caused an increase, and the acidosis a decrease, in the intracellular phase. W. McC.

**Exchange of salt and water between muscle and blood. III. Effect of dehydration.** L. EICHELBERGER and A. B. HASTINGS (J. Biol. Chem., 1937, 118, 205—218; cf. this vol., 87).—Following injection of hypertonic aq. NaCl or sucrose, intravenously or intraperitoneally, the muscles of normal dogs decrease in vol.; the extracellular phase increases and the cells shrink. Isotonic aq. sucrose or glucose, injected intraperitoneally, decreases the vol. of muscle for 2.5 hr., both extra- and intra-cellular phases losing  $H_2O$ . F. A. A.

**Experimental production of [biological] mutations by the action of chemicals.** H. STUBBE (Angew. Chem., 1937, 50, 241—246).—A review of published work indicates that certain chemicals can increase the frequency with which mutations occur, but as yet there is no proof that sp. substances are capable of producing sp. mutations. F. C. B. M.

**Inversion of the effect of one constrictor substance by another.** M. BEAUVALLET (Compt. rend. Soc. Biol., 1937, 124, 727—729).—The effect of adrenaline on the melanophores of fish scales is reversed if they are previously contracted with KCl or  $BaCl_2$ . Similarly the contraction observed with KCl is reversed if previous treatment with ergotamine tartrate or  $BaCl_2$  is given. H. G. R.

**Occurrence of bromine in the thyroid gland of animals treated with large amounts of bromide.** I. SIMON (Boll. Soc. ital. Biol. sperim., 1936, 11, 831).—Administration of NaBr or dibromocholesterol to rabbits causes the appearance of Br and the partial or complete displacement of I in the thyroid. F. O. H.

**Effects of iodine given to rabbits after cholesterol feeding.** K. B. TURNER and E. H. BIDWELL (Proc. Soc. Exp. Biol. Med., 1937, 35, 656—660).—The decrease in cholesterol (I) of rabbit liver after cessation of (I) feeding is unaffected by KI, whereas the decline in adrenal wt. and blood (I) is inhibited. P. G. M.

**Combined action of sodium fluoride and vitamin-D on some bone constituents.** P. MASCHERPA and G. LUSIGNANI (Boll. Soc. ital. Biol. Sperim., 1936, 11, 720—723).—The action of subcutaneously injected NaF on the bone constituents (especially Ca) of guinea-pigs is modified by simultaneous administration of vitamin-D. F. O. H.

**Toxicity of sodium tetrathionate.** B. CACCIAVILLANI (Boll. Soc. ital. Biol. sperim., 1936, 11, 756—758).—The min. lethal dose (intravenously in rabbits) is 0.10—0.30 g. per kg. according to the method of prep. F. O. H.

**Factors affecting human potassium tolerance.** R. L. ZWEMER and R. TRUSZKOWSKI (Proc. Soc. Exp. Biol. Med., 1936, 35, 424—426).—Oral administration of 10 mg. of K per lb. of body-wt. does not affect plasma-K (I) in health but increases it rapidly in Addison's disease. When the dose is 20 mg. (I) is increased also in health. In adrenal insufficiency intake of approx. this dose in the diet increases (I) before but not after administration of extract of adrenal cortex. W. McC.

**Increase of glutathione in the liver following sulphur medication.** A. GOSSET and L. BINET (Compt. rend., 1937, 204, 206—208).—Beneficial results of dosage with S compounds of patients suffering from acute post-operative conditions are recorded. Rabbits, following interperitoneal or intravenous injection of thiosinamine, show marked increases in the glutathione content of the blood, liver, and kidneys. F. A. A.

**Excretion of mercury after oral administration of mercury with chalk, yellow mercurous iodide, and corrosive sublimate.** T. SOLL-

MANN, N. E. SCHREIBER, H. N. COLE, H. DEWOLF, and J. V. AMBLER (Arch. Dermatol. Syphilol., 1935, **31**, 15—25).—Urinary excretion of Hg after oral administrations is essentially the same as after use of Hg ointment.  
CH. ABS. (p)

**Excretion of mercury after clinical intramuscular and intravenous injections.** T. SOLL-MANN, N. E. SCHREIBER, and H. N. COLE (Arch. Dermatol. Syphilol., 1935, **32**, 1—48).—Urinary excretion of Hg is an index of diffusible Hg. Faecal excretion is negligible except with flumerin. Antisyphilitic efficiency depends on concn. of Hg ions. That fixed in tissues is inoperative. In all effective treatments excretion is progressively cumulative. 31—70% of diffusible Hg in org. preps. and 96—99% of the Hg of colloidal solutions is fixed in tissues.  
CH. ABS. (p)

**Influence of bromoacetate, sodium fluoride, and sodium oxalate on glycolysis in muscle.** A. HAHN and H. OTTAWA (Z. Biol., 1937, **98**, 81—88).—Disappearance of glycogen and phosphorylation of carbohydrate in ox muscle pulp at 37° and  $p_H$  7 are greatly increased by 0.01—0.02 *M*-CH<sub>2</sub>Br·CO<sub>2</sub>Na, NaF, or Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub>; formation of AcCO<sub>2</sub>H (I) from added phosphoglyceric acid is also increased. The anomaly of increased formation of both (I) and lactic acid is due to addition of semicarbazide as interceptor for (I).  
F. O. H.

**Modified composition of iodobismutol. Results on local irritation.** P. J. HANZLIK, C. W. BARNETT, and A. P. RICHARDSON (Arch. Dermatol. Syphilol., 1935, **32**, 284—287).—Tolerance for iodobismutol injections was increased by addition of saligenin as a local anæsthetic. Propylene glycol is substituted for (CH<sub>2</sub>·OH)<sub>2</sub> as solvent to avoid the cumulative toxicity of the latter.  
CH. ABS. (p)

**Arsphenamine sensitisation of the skin.** H. HAXTHAUSEN (Arch. Dermatol. Syph., 1935, **171**, 583—589).—Diazotised arsphenamine alone or coupled with horse serum produced hypersensitivity to As in all persons tested. When coupled with human serum hypersensitivity occurred in only 1 of 8 cases.  
CH. ABS. (p)

**Hæmatologic-biochemical changes in blood from neoarsphenamine.** I. R. BACHROMEYEV and L. N. PAVLOVA (Arch. Dermatol. Syph., 1934, **170**, 543—549).—Changes in blood-Ca and -K and leucocyte count following injection of neoarsphenamine into cows are recorded.  
CH. ABS. (p)

**Chemotherapeutic action. I. Absorption of arsenical compounds and tartaremetic by normal and resistant trypanosomes and its relation to drug-resistance.** F. HAWKING (J. Pharm. Exp. Ther., 1937, **59**, 123—156).—Using sufficiently dil. solutions of typical As<sup>III</sup> compounds, normal trypanosomes absorb all the available drug and suffer no appreciable damage. Absorption is very rapid, being complete at 37° in a few min. Living atoxyl-resistant organisms absorb little or none of the compounds unless the concn. be increased. Compounds such as tartar emetic and phenylarsenoxide to which atoxyl-fast trypanosomes show no resistance are absorbed to the same extent by both types, whilst

tryparsamide, which is inactive *in vitro*, is not absorbed by either. The nature of the side-chain attached to the arsenoxide nucleus is of importance in determining the degree of resistance, and it appears that the nucleus combines with "receptors" of normal trypanosomes, and that such combination with resistant organisms may be prevented by the presence and nature of side-chain.  
J. N. A.

**Trypanocidal activity and arsenic content of cerebrospinal fluid after administration of arsenic compounds.** F. HAWKING, T. J. HENNELLY, and J. H. QUASTEL (J. Pharm. Exp. Ther., 1937, **59**, 157—175).—A method of examining *in vitro* the trypanocidal activity of cerebrospinal fluid (normally inactive) after intravenous injection of arsenicals is described. Injection of tryparsamide (I) produces considerable activity in the fluid, the total As content of which decreases much more rapidly than the activity. The power of orsanine to produce activity is < that of (I), whilst neoceryl is almost inactive. As<sup>III</sup> compounds result in low [As] in the fluid and the activity is slight or absent. Using (I) there was no significant difference in As content or activity of the fluid of patients with and without organic lesions.  
J. N. A.

**[Pharmacology of] gold salts, particularly strontium aurothiopropionatesulphonate.** A. LEULIER, G. BERVARD, and P. LOISY (J. Pharm. Chim., 1937, [viii], **25**, 193—216).—The distribution and fixation of the salt in the organs of guinea-pigs and the rate of elimination have been examined. The tolerated dose is about 45 mg. per kg. and the urinary secretion and toxicity are < those of the more sol. salts. In guinea-pigs and rabbits, but not in man, it increases urinary albumin and glucose. E. H. S.

**Action of chemical reagents on striated muscle-fibres.** G. CIACCIO (Boll. Soc. ital. Biol. sperim., 1936, **11**, 798—801).—The behaviour of histological elements on treatment with EtOH, acids, fat solvents, pepsin, etc. is described. F. O. H.

**Relationship between variation in body-weight and the content of ascorbic acid in the liver of guinea-pigs.** G. SCOZ (Boll. Soc. ital. Biol. sperim., 1936, **11**, 907—908).—Loss of body-wt. in rabbits (due to thyroxine) or in rats (starvation) is accompanied by decrease in liver-ascorbic acid.  
F. O. H.

**Sympatheticomimicity. III. Physiological effects of more non-amino catechol derivatives.** R. L. OSBORNE (Proc. Soc. Exp. Biol. Med., 1937, **35**, 567—570; cf. A., 1935, 1412).—Non-NH<sub>2</sub> pyrocatechol derivatives increase blood pressure in the intact cat. This action is not abolished by acetylation of, or introduction of the ethanone group into, the compounds.  
P. G. M.

**Influence of amino-acids and choline on the pigment-excreting function of the liver.** T. MATSUURA and A. KASHIMURA (Japan. J. Gastroenterol., 1935, **7**, 115—119).—A series of NH<sub>2</sub>-acids and amines failed to stimulate excretion of azo-fuchsin-G from livers of rabbits.  
CH. ABS. (p)

**Effects of prolonged administration of moderate doses of creatine in rats.** H. C. STRUCK and M. B.

VISSCHER (Proc. Soc. Exp. Biol. Med., 1937, **35**, 532—535).—Rats receiving, for 4—6 months, a diet containing 2 g. of creatine (I) hydrate per kg. showed no increase in (I) content of muscle, liver, or heart.

P. G. M.

Action of carbamylcholine chloride on gastric secretion. P. DESTREE (Compt. rend. Soc. Biol., 1937, **124**, 853—855).—An increase in the secretion of gastric juice, HCl, and mucus was observed. This was absent in atropinised animals (dogs).

H. G. R.

Xanthurenic acid. Elimination following parenteral administration of tryptophan. F. M. CHIANGONE (Boll. Soc. ital. Biol. sperim., 1936, **11**, 821—823).—Subcutaneous injection of tryptophan (0.20 g. daily) into rats is followed within 24 hr. by urinary excretion of xanthurenic acid (Musajo, A., 1935, 1268); with oral administration, 0.30 g. daily is required to give a similar excretion.

F. O. H.

Anthelmintics. II. Comparison of certain ozonides, chenopodium oil, and diheptanol peroxide. L. W. BUTZ and W. A. LA LANDE, jun. (J. Amer. Pharm. Assoc., 1937, **26**, 114—121; cf. A., 1935, 246).—Ozonised oils [Et oleate, oleic acid, cotton-seed (I) and olive oil], diheptanol peroxide (II), and 0.1% H<sub>2</sub>O<sub>2</sub> are toxic to *Ascaris lumbricoides*. The min. therapeutic doses of ozonised (I) and (II) are > that of oil of chenopodium.

F. O. H.

Theory and pharmacological and chemotherapeutic action of auxochromes. II. B. BREYER (Boll. Soc. ital. Biol. sperim., 1936, **11**, 948—951; cf. A., 1936, 1292).—Vals. for  $\kappa$  of aq. solutions and differences in reaction with H<sub>2</sub>S of 9 HgPh derivatives are discussed as a preliminary to an account of their biological properties.

F. O. H.

Influence of pharmaceuticals on experimental ursole sensitisation in animals. F. MARQUARDT (Arch. Dermatol. Syph., 1935, **171**, 430—439).—Hypersensitivity of guinea-pig skin to ursole is prevented by large doses of adrenaline given simultaneously. Atropine, morphine-scopolamine, phenobarbital, and thyreoglandol have no action.

CH. ABS. (p)

Effect of piperidinomethylbenzodioxan (933F) and yohimbine on the action of certain drugs and ions on the nictitating membrane. J. F. ROSS (Amer. J. Physiol., 1936, **116**, 574—576).—Responses to acetylcholine, CaCl<sub>2</sub>, KCl, adrenaline, and sympathin are decreased.

R. N. C.

Action of veratrine on the Purkinje fibres. M. GOLDENBURG and C. J. ROTHBERGER (Pflüger's Archiv, 1936, **238**, 137—152).

M. A. B.

Lesions in the pancreas and in the anterior pituitary with fatal acidosis following prolonged intravenous administration of glucose (in dogs). H. R. JACOBS and A. R. COLWELL (Amer. J. Physiol., 1936, **116**, 194—200).—Prolonged intravenous infusion of glucose (I) at 0.7—4.5 g. per kg. per hr. causes early and sustained increase of (I) tolerance (which fails terminally), high storage of liver-glycogen, and progressive depletion of the alkali reserve, leading to fatal acidosis. The formation of an unidentified

acidic intermediate product of (I) metabolism in excessive amounts is surmised.

R. N. C.

(A) Liberation from stimulated nerve of a substance sensitising leech-muscle preparations to acetylcholine. G. BERGAMI, G. CANTONI, and T. GUALTIEROTTI. (B) Influence of glucose on the action of eserine and acetylcholine on leech muscle. G. BERGAMI, T. GUALTIEROTTI, and G. CANTONI (Boll. Soc. ital. Biol. sperim., 1936, **11**, 741—742, 742—743).—(A) See A., 1936, 1413.

(B) Glucose (I) has no effect on the sensitising action of eserine on muscle preps., whilst the subsequent action of acetylcholine (II) is increased rather than diminished. Hence (I) may be used to differentiate (II) from the (II)-like substance liberated from stimulated nerve (*loc. cit.*).

F. O. H.

Is a portion of the pancreatic secretory response to a meal due to the absorption of digested food products? J. GRAY, M. S. KIM, and A. C. IVY (Amer. J. Physiol., 1936, **116**, 210—213).—The pancreatic responses to liver extract, peptone, glucose, and emulsified fat are negligible compared with that to secretin, which is probably the only humoral agent concerned in response to meals.

R. N. C.

Lecithin and liver-glycogen in normal and thyroidectomised rabbits. F. VACIROA (Boll. Soc. ital. Biol. sperim., 1936, **11**, 813—814).—Intravenous injection of aq. emulsion of lecithin into normal rabbits reduces the liver-glycogen (I) from 2.923 to 0.241%; no concomitant hyperglycemia occurs. The reduction in (I) does not occur in thyroidectomised rabbits [average (I) 1.6%].

F. O. H.

Action of single intravenous injections of callicrein. K. CREMER (Z. ges. exp. Med., 1936, **97**, 703—707; Chem. Zentr., 1936, **i**, 3166).—The injection is followed by marked leucopenia and subsequent leucocytosis, a diminution in alkali reserve, and an increase in urinary p<sub>H</sub>.

A. G. P.

Hyper-tensive and -glycemic action of hyper-tensive cerebrospinal fluid injected into dogs after suppression of the pressor-receptor nerves. S. DELEONARDI (Boll. Soc. ital. Biol. sperim., 1936, **11**, 704—707).—The fluid of denervated dogs, on intravenous injection into the donor, increases the arterial blood pressure and the blood-sugar.

F. O. H.

Local anaesthetics. G. H. ELLINGHAM (Brit. Dental J., 1935, **59**, 198—205).—A general discussion with particular reference to procaine.

CH. ABS. (p)

Effect of ether on the gut. G. A. EMERSON (Proc. Soc. Exp. Biol. Med., 1936, **35**, 376—381).—In rats on diets of dextrin (I) and caseinogen or (I) and ovalbumin reduction of ingested Fe<sub>2</sub>O<sub>3</sub> in the gut is increased by repeated Et<sub>2</sub>O anaesthesia. Adrenaline hydrochloride in single doses of 0.5 mg. per kg. has a similar effect. Corresponding changes are not produced in human urine by Et<sub>2</sub>O anaesthesia.

W. McC.

Ascorbic acid of tissues after ether anaesthesia. D. E. BOWMAN and E. MUNTWYLER (Proc. Soc. Exp. Biol. Med., 1937, **35**, 557—558).—The ascorbic acid (I) content of liver and kidneys of rats killed > 4 hr.

after Et<sub>2</sub>O-anæsthesia is >, and that of the adrenals is <, that of controls. In guinea-pigs (I) diminishes in all three tissues and spleen after Et<sub>2</sub>O-anæsthesia.

P. G. M.

**Analgesia produced by nitrous oxide, ethylene, and cyclopropane in the normal human subject.** M. H. SEEVERS, J. H. BENNETT, H. W. POHLE, and E. W. REINARDY (J. Pharm. Exp. Ther., 1937, 59, 291—300).—The optimum concn. of the three gases which produces the max. degree of analgesia is N<sub>2</sub>O 35—40, C<sub>2</sub>H<sub>4</sub> 25—35, and cyclopropane 4—6%. These vals. are unaffected by the substitution of O<sub>2</sub> for air.

P. G. M.

**Rapidity of absorption of neutral atropine sulphate from the conjunctival sac in relation to the osmotic pressure of the solution.** I. SIMON (Arch. Farm. sperim., 1936, 62, 197—203).—Decreasing rapidity of absorption (indicated by mydriasis in man and rabbit) gives the order, hyper-, hypo-, and iso-tonic solutions (aq. atropine sulphate-NaCl); excessive hypertonicity diminishes the rate to vals. approximating to those due to hypotonicity.

F. O. H.

**Physiology and pharmacology of the autonomous nervous system.** Z. M. BACQ and F. LEFEBVRE (Arch. int. Pharmacodynam. Ther., 1935, 49, 363—378; Chem. Zentr., 1936, i, 3169).—Stovaine, like cocaine, sensitises the third eyelid in cats to the action of the adrenaline group and has a desensitising action in respect of tyramine and ephedrine. Other drugs are similarly examined and relations between chemical constitution and sensitising power are discussed.

A. G. P.

**Effect of cocaine on the protein content of recently produced aqueous humour.** P. C. KRONFELD and C. K. LIN (Proc. Soc. Exp. Biol. Med., 1936, 35, 401—403).—The protein content of the recently produced humour drawn from human eyes after a 45—65 min. interval is that of the original humour. The extent of the increase with cocaine as the anæsthetic is when butyn or pantocaine (having no vasoconstrictor effect) is used.

W. MCC.

**Effect of morphine hydrochloride and phenylpropionate on diuresis and the volume of the kidney.** A. CLERC, R. PARIS, and C. MACREZ (Compt. rend. Soc. Biol., 1937, 124, 714—716).—Renal vaso-constriction and oliguria were observed in the dog after 1—3 mg. per kg. of the hydrochloride, the corresponding dose of phenylpropionate being 2—3 times as great.

H. G. R.

**Influence of nicotine on blood-iodine and -cholesterol.** L. H. STRAUSS and P. SCHEER (Klin. Woch., 1936, 15, 187—190; Chem. Zentr., 1936, i, 3166).—In occasional smokers and in nicotine-sensitive and hyperthyrotic men nicotine (I) increased blood-I. In habitual smokers and hypothyrotics vals. decreased. Similar changes occurred in animals in acute or chronic (I) poisoning. Blood-cholesterol curves were not characteristic indices of (I) poisoning.

A. G. P.

**Strychnine. VIII. Relationship of borax and other chemicals to toxicity.** J. C. WARD, D. A. SPENCER, and F. E. GARLOUGH (J. Amer. Pharm.

Assoc., 1937, 26, 129—134).—The rate of toxic action of strychnine in rats is increased by certain substances (e.g., NaN<sub>3</sub>, NaNO<sub>2</sub>) and decreased by others (e.g., tannic acid, EtOH).

F. O. H.

**Pharmacology of the alkaloids of *Erythrophloeum guineense* and of the Madagascar species.** I. Toxicity and general action in frogs and mice. II. General action in rabbits. R. SANTI and B. ZWEIFEL (Boll. Soc. ital. Biol. sperim., 1936, 11, 758—760, 760—762).—Data are given for cassaine, cassaidine, norcassaidine, omofleine, erythrofleine, and madagascar, C<sub>26</sub>H<sub>41</sub>O<sub>6</sub>N (Dalma, A., 1936, 350).

F. O. H.

**Affinity of alkaloids from *Erythrophloeum guineense* and of *Digitalis* glucosides.** G. DALMA (Boll. Soc. ital. Biol. sperim., 1936, 11, 791—794).—The similarity of the pharmacological properties and empirical formulæ of the alkaloids (A., 1936, 350) to those of various cardiac aglucones suggests that the structural formulæ are similar, e.g., cassaine and digoxigenin (Tschesche et al., A., 1936, 730).

F. O. H.

**Taste tests. IV. Relative bitterness.** F. M. SCHOLL and J. C. MUNCH (J. Amer. Pharm. Assoc., 1937, 26, 127—129).—Comparative data for the bitterness of brucine (1000—1250), strychnine (320), quinine (100), aloin (33), theobromine (5), etc. are given.

F. O. H.

**Treatment of arsenical hepatitis with sodium dehydrocholate. Arsphenamine poisoning.** B. APPEL and I. R. JANKELSON (Arch. Dermatol. Syphilol., 1935, 32, 422—425).—Toxic hepatitis during treatment of syphilis results from As-damage to liver. As appearing in fæces after intravenous administration of arsphenamine (I) results from excretion from the liver via the gall bladder. Addition of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> (II) increases As excretion. Na dehydrocholate (III) is still more effective. In rabbits (III) was more active than (II) in increasing the ratio, wt. of liver/% of (I) retained.

CH. ABS. (p)

**Disturbances in liver metabolism in arsenobenzene poisoning.** A. WIEDMANN (Arch. Dermatol. Syph., 1935, 173, 173—180).—Arsenobenzene disturbs the carbohydrate and protein economy of the liver. Depletion of glycogen may be avoided by administration of sugar.

CH. ABS. (p)

**Treatment of acute mercurial poisoning with sodium formaldehydesulphoxylate.** J. M. MUÑOZ (Rev. Soc. argentina biol., 1935, 11, 224—229).—Hg salts are reduced to Hg.

CH. ABS. (p)

**Destruction of the dehydrogenases of *Staphylococcus aureus* by heat. Protective action of the substrate.** D. BACH (Compt. rend., 1937, 204, 158—160).—Complete inactivation (in PO<sub>4</sub>''' buffer at p<sub>H</sub> 7.2) occurs at 60°, the rate being diminished by presence of substrate (lactate, glucose).

F. O. H.

**Action of X-rays on lactate, glucose, citrate, and succinate dehydrogenases.** R. E. HARVARD (Brit. J. Radiol., 1935, 8, 787—792).—Irradiation with 20,000 rontgens slightly inactivated the succinic dehydrogenase only. A similar dosage of γ-rays produced the same effect.

CH. ABS. (p)

**Cataphoresis of alcohol apodehydrogenase.** H. VON EULER and H. HELLSTROM (Z. physiol. Chem., 1937, 246, 149—154; cf. Sreenivasaya, this vol., 98).—The isoelectric point of the purified enzyme is  $p_H$  5.2. W. McC.

**Crystallisation of the protein of acetaldehyde reductase.** E. NEGELEIN and H. J. WULFF (Biochem. Z., 1937, 289, 436—437).—The cryst. protein (I) has been isolated from extract of bottom yeast. 0.00035 mg. of (I) transfers, per min., 0.75 c.c. of H from EtOH to  $C_5H_5N$ . If the mol. wt. of (I) is 70,000, one mol. interacts, per min. at 40°, with 7000 mols. of EtOH. W. McC.

**Choline esterase.** M. H. ROEPKE (J. Pharm. Exp. Ther., 1937, 59, 264—276).—The dissociation consts. of the enzyme-substrate complex have been determined for acetyl-, acetylarseno-, and butyryl-choline. The consts. of the enzyme-inhibitor complex have been determined for choline, arseno- and acetyl- $\beta$ -methyl-choline, and certain alkaloids and inorg. salts. P. G. M.

**Allantoicase. Occurrence in the animal organism.** A. BRUNEL (Compt. rend., 1937, 204, 380—382).—In addition to the mycelia of *Aspergillus niger* and *Sterigmatocystis phoenicis*, the liver of *Raja clavata*, L., *R. punctata*, Risso, and of various species of *Rana* contain an enzyme, allantoicase, which hydrolyses allantoic acid to urea and  $CHO \cdot CO_2H$ . F. O. H.

**Enzymes in snake venom. II. Their action on native proteins, on peptones, and on the activity of trypsin.** B. N. GHOSH and S. S. DE (J. Indian Chem. Soc., 1936, 13, 627—633; cf. A., 1936, 1557).—The proteolytic enzyme of Russell's viper venom resembles trypsin, the optimum being 8 for gelatin and ovalbumin and 7 for casein. Since this venom and that of the cobra digest Witte's peptone, best at  $p_H$  8.2—8.4, they contain a peptidase similar to erepsin. Both venoms inhibit the proteolytic activity of Merck's trypsin. The reported activation of inert pancreatic juice by the venom is due to formation of chymotrypsin by the "trypsin" of the venom. R. S. C.

**Refractometric determination of trypsin.** J. JANICKI (Biochem. Z., 1937, 289, 348—353).—Serum-albumin (I) in aq. medium containing  $CaCl_2$  at  $p_H$  8.9 is coagulated by heating at 100° and its degradation at 35° by trypsin, previously activated with enterokinase, is measured with a Pulfrich refractometer. Removal of fat from (I) increases the extent of the degradation. W. McC.

**Chemical nature of taka-amylase. I. Enzymic digestion of taka-amylase by proteases.** S. AKABORI and K. OKAHARA (Bull. Chem. Soc. Japan, 1937, 12, 55—58).—Taka-amylase (I) preps. on digestion with trypsin and papain show no loss in amylase activity despite considerable hydrolysis of protein present. (I) can be partly dialysed against 50% MeOH through collodion membranes, and preps. obtained from the dialysate give no ppt. with  $CCl_3 \cdot CO_2H$ , give a strong Molisch reaction, and show no loss in activity after digestion with erepsin. (I) is therefore neither protein nor polypeptide. E. A. H. R.

**Enzymic hydrolysis of melibiosecarboxylic acid.** C. CATTANEO (Boll. Soc. ital. Biol. sperim., 1936, 11, 902—904).—Melibiosecarboxylic acid [*Ba* salt, prepared from melibiose by treatment with  $HCN \cdot NH_3$ , followed by hydrolysis with  $Ba(OH)_2$ , isolation of the Pb salt, decomp. by  $BaCO_3$ , and pptn. by  $COMe_2$ ] is hydrolysed by  $\alpha$ -galactosidases. F. O. H.

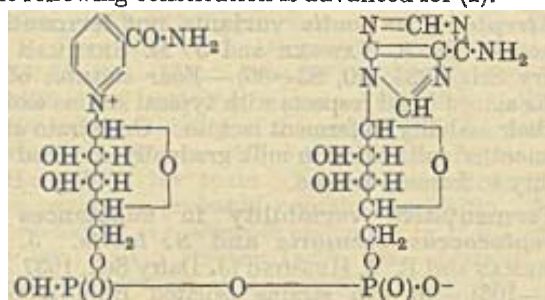
**Invertase. I. Isolation and purification. II—VI. Thermal analysis of invertase action.** (i) Determination of reaction heat. (ii) Amount of enzyme; (iii) sucrose concentration; (iv) hydrogen-ion concentration; (v) temperature, and reaction velocity. VII. Theoretical consideration. T. KÔZAKI (Japan. J. Gastroenterol., 1935, 7, 125—134, 135—147, 148—153, 154—161, 162—166, 167—172, 173—178).—I. The isolation of a highly active prep. of the "abnormal" type of  $\beta$ -*h*-fructosidase from autolysed brewers' yeast is described.

II—VI. The inversion heat of sucrose (I) was 4.1 cal. per g.-mol. The inversion reaction follows the equation  $dx/dt = k_1 \sqrt{(a_1 + x)}$  in the earlier stage and  $b_1(a - x)/(a_2 - cx)$  subsequently.  $k_1$  and  $b_1$  are directly related to the amount of enzyme but the time of the first reaction is not affected by the concn. of invertase.  $k_1$  and  $b_1$  are little influenced by the concn. of (I) whereas  $a_1$  is inversely related except in concns. of 2.0—7.5%. The time of the first reaction declines with decrease in initial concn. of (I).  $k_1$  and  $b_1$  are const. at 2.9—5.1 and decrease at 6.2—7.0; they have optimum vals. at 37°. Heat-inactivation begins at 35°. CH. ABS. (p)

**Phosphate-transferring co-enzymes (cophosphorylases).** H. VON EULER and E. ADLER (Z. physiol. Chem., 1937, 246, 83—98).—In the system phosphoglyceric acid (I)—undialysed yeast extract, adenylic acid (II) cannot be replaced by pure cozymase (III). With (I)—dialysed yeast extract, (III) induces fermentation above the "zero" action but to a smaller extent than (II) and the reaction is not determined by the concn. of (III). In the formation of a  $P_2O_7$  fraction during the fermentation of (I), (II) cannot be replaced by (III). Dialysed yeast extract in presence of glucose and  $CH_2I \cdot CO_2'$  does not ferment (I); action is induced by (II), the concn. of which has a more marked effect on the induction period than on the rate of fermentation. (III) exerts a similar action differing mainly by a smaller efficiency at higher concn. Similar results are recorded for the use of apozymase. Apparently in these cases (II) can be replaced by (III) but the question whether (III) can function as cophosphorylase is left open. H. W.

**Cozymase.** H. VON EULER and F. SCHLENK (Z. physiol. Chem., 1937, 246, 64—82; cf. A., 1936, 894).—Two methods are described whereby the activity of cozymase (I) ( $A_{Co} = 400,000$ ; *loc. cit.*) is increased to  $A_{Co}$  650,000 at which finality appears to be reached. Yeast is more profitable than blood cells of the horse as source of (I). As thus prepared (I) is white and sol. without residue in  $H_2O$ . It does not fluoresce in acid or alkaline solution. Its reactions do not suggest the presence of any impurity. The OI' reaction (Willstätter-Schudel) appears a typical change of

pyridinium bases. Titration, in presence of indicator or electrometrically, establishes its monobasicity, as does the isolation of the salt,  $(C_{21}H_{26}O_{14}N_7P_2)_2Ba$ . Reasons are advanced for considering the carbohydrate components to be two mols. of pentose and the following constitution is advanced for (I).



H. W.

Mechanism of reduction of cozymase with hyposulphite. H. HELLSTROM (Z. physiol. Chem., 1937, 246, 155—162).—Measurement of light absorption and oxidation-reduction potential shows that cozymase (I) with  $Na_2S_2O_4$  rapidly (1 min.) yields first monohydrocozymase (II) (the yellow intermediate product) which is then converted, very slowly at  $p_H$  13, more rapidly at  $p_H$  7.6, into dihydrocozymase (III). The conversion of (I) into (II) [and possibly also that of (II) into (III)] is reversible (cf. Warburg *et al.*, A., 1936, 377).

W. McC.

Complementary oxidation in the autofermentation of yeast. L. PLANTEFOL (Ann. Physiol. Physiochim. biol., 1935, 11, 427—460; Chem. Zentr., 1936, i, 2959).—The complementary oxidation on transference of yeast from an atm. of  $N_2$  into air is shown by increased  $O_2$  consumption and a diminution in R.Q. The effect varies with different yeasts.

A. G. P.

Influence of oxygen tension on the gaseous exchange of yeast. Autofermentation. L. PLANTEFOL (Ann. Physiol. Physiochim. biol., 1935, 11, 243—260; Chem. Zentr., 1936, i, 3157).—The ratio (R) of  $CO_2$  produced in the absence to that in the presence of  $O_2$  is very small (0.1—0.2), sugar-fermenting and non-fermenting yeasts behaving similarly. If the quotient  $CO_2/O_2$  in air is  $>1$  R is increased. Decrease in  $O_2$  tension diminishes  $CO_2$  production and  $O_2$  consumption. The gaseous exchange of yeasts is compared with that of higher plants.

A. G. P.

Hydrogenation of isobutyroin under conditions of alcoholic fermentation.—See A., II, 177.

Theory of alcoholic fermentation.—See B., 1937, 177.

Porphyrin formation by pathogenic fungi of the skin. C. CARRIE and A. S. VON MALLINCKRODT-HAUPF (Arch. Dermatol. Syph., 1934, 170, 521—529).—Organisms, e.g., *Sporotrichum* and yeasts, which are elaborated in the deeper skin layers or inside the body develop more porphyrin than those which remain in surface skin layers. CH. ABS. (p)

Fungistatic and fungicidal effects of two wood-preserving chemicals on human dermatophytes. Sodium o-2-chlorophenylphenoxide and

tetrachlorophenoxide. L. M. WIEDER (Arch. Dermatol. Syphilol., 1935, 31, 644—655).

CH. ABS. (p)

"Membrane method" for determining fungicidal action of chemicals: clinical implications. H. SHARLIT (Arch. Dermatol. Syphilol., 1935, 31, 217—223).—Tests are made with collodion films impregnated with the fungicide. Tetraiodohexamethylenetetramine and BzOH were fungistatic against all organisms examined except *Aspergillus niger*, against which thymol was effective. Thymol volatilised from the membrane and was absorbed by the medium. The fungicidal val. of salicylic acid and the fungistatic action of  $H_3BO_3$  are high since these agents diffuse rapidly through the skin and are eliminated unchanged in urine.

CH. ABS. (p)

Mycostatic studies on certain *Monilia* and related fungi. P. GOMEZ-VEGA (Arch. Dermatol. Syphilol., 1935, 32, 49—58).—Fungistatic effects of dyes and disinfectants are examined. Crystal-violet had a therapeutic action in several dermatomycoses. Mecurochrome was fungistatic at concns. of 1:10,000 in sunlight but ineffective at 1:500 without sunlight.

CH. ABS. (p)

Action at a distance of metals on some species of fungi. E. CORNEU (Riv. pat. veg., 1934, 24, 397—406).—Suspensions of spores of *Penicillium glaucum* showed greatly reduced germination when placed 1—3.5 mm. from Pb discs in sealed containers. On removal from the metal growth was resumed and was more rapid than in controls. The effect was more marked on single spores than on spore masses and was insignificant in open containers or with Cu or Ag discs in closed ones. The distance of the metal from the spores was less important than the area of the disc and the vol. of the container; for a given sized disc the effect increased as the vol. of container decreased. Other fungi were less affected. The action of the metal is ascribed to increasing accumulation of secondary radiation or to the more complete ionisation of the atm.

CH. ABS. (p)

Action of certain metals at a distance, in contact, and in solution on development of *Thelavia basicola*, Zopf, and on that of other fungi. C. SEMPLO (Riv. pat. veg., 1934, 24, 413—491).—Pb, placed 1—2 mm. from a hanging drop culture of *T. basicola*, retards or prevents germination of conidia; mycelium develops abnormally and no conidia are formed. Removal of Pb at or before commencement of germination permits normal growth. Cu and Al show similar but much weaker action; Pt, Au, and Ag do not affect germination but slightly retard growth of germ tubes. Cu, Au, or Ag filings in contact with conidia inhibit growth, much metal passing into colloidal solution; Au and Pt have little effect and Pb is slightly depressive. In solution as nitrates in the presence of sugar and glycine Cu, Al, and Pb had no effect, Au and Pt showed small action, and Ag completely inhibited growth.

CH. ABS. (p)

Fat production by micro-organisms. Fat formation by strains of *Oidium lactis* (*Oospora lactis*). H. FINK, G. HAESELER, and M. SCHMIDT (Z. Spiritusind., 1937, 60, 74, 76—77, 81—82).—

Ten of 50 strains of *O. lactis* gave considerable yields of fat. Optimum production of mycelium and fat by two strains, examined in detail, occurred with 4 and 6% sugar in media at 25–30°. Under conditions leading to the greatest mycelial growth, the yield of protein was lowest and that of fat highest. The fat yield exceeded that of *Endomyces vernalis*, Ludwig, and *P. javanicum* under the same conditions of culture. Whey proved a useful nutrient solution and urea and  $(\text{NH}_4)_2\text{SO}_4$  good sources of N.

P. W. C.

**Fat of the mould *Citromyces* sp.** K. TAUFEL, H. THALER, and H. SCHREYEGG (Fette u. Seifen, 1937, 44, 34–38).—The fat had acid val. 72.4, sap. val. 170.0, ester val. 97.6, Reichert–Meissl val. 0.8, Polenske val. 0.8, I val. (Hanus) 125.8. It contained glycerol 4.9%, unsaponifiable matter (containing ergosterol) 9.9%, palmitic 5.8%, stearic 10.0%, oleic 34.4%, and linoleic acid 34.4%. The absence of fat acids between  $\text{C}_6$  and  $\text{C}_{14}$  and of Me ketones indicates that the formation of the ketones from acids of medium mol. wt. is a pathological reaction.

F. C. B. M.

**Production of oxidoethylene- $\alpha\beta$ -dicarboxylic acid by mould.** K. SAKAGUCHI, T. INOUE, and S. TADA (Proc. Imp. Acad. Tokyo, 1937, 13, 9–11).—The acid is produced, in yields of 10–20% of the sugar utilised, when a mould (? sp.) is grown on synthetic medium containing glucose as sole source of C.

L. D. G.

**Structure of galactocarolose produced from glucose by *Penicillium Charlesii* (G. Smith).**—See A., II, 178.

**Crystalline colouring matters of *Fusarium culmorum*.**—See A., II, 159.

**Determination of nitrogen and carbon in small amounts of plankton (in sea-water).** T. VON BRAND (Biol. Bull., 1935, 69, 221–232).—The plankton together with inorg. hydroxides are separated from sea- $\text{H}_2\text{O}$  by pptn. with KOH, redissolution in  $\text{H}_2\text{SO}_4$ , and repptn. with KOH. N is determined by the method of Krogh and Keys (A., 1935, 185) and C by a modification of that of Krogh and Rehberg (A., 1930, 1485). 10–100  $\times 10^{-6}$  g. of C may be determined with an error  $\pm 3 \times 10^{-6}$  g.

CH. ABS. (p)

**Nodule bacteria symbiosis of the Leguminosæ.** A. RIPPEL (Chem.-Ztg., 1937, 61, 229–230).—A review.

R. M. M. O.

**Production of dihydroxyacetone by the action of *Acetobacter suboxydans* on glycerol.** L. A. UNDERKOFER and E. I. FULMER (J. Amer. Chem. Soc., 1937, 59, 301–302).— $\text{CO}(\text{CH}_2\cdot\text{OH})_2$  (I) is formed in max. yield (about 90%) when *A. suboxydans* is grown on a medium containing glycerol (6), yeast extract ( $\leq 0.5$ ), and  $\text{KH}_2\text{PO}_4$  (0.1–0.3%) at  $p_{\text{H}}$  5.5–7. (I) is isolated by a modification of Neuberg and Hofmann's method (A., 1935, 1282).

H. B.

**Intermediate metabolism of propionic acid bacteria.** H. G. WOOD, R. W. STONE, and C. H. WERKMAN (Biochem. J., 1937, 31, 349–359).—The intermediate nature of phosphoglyceric acid (isolated),  $\text{AcCO}_2\text{H}$ ,  $\text{AcCHO}$ ,  $\text{AcOH}$ , and lactic (I) and succinic

acid (II) in the formation of  $\text{EtCO}_2\text{H}$  from glucose by *Propionibacterium* was investigated.  $\text{AcCO}_2\text{H}$  is oxidised to  $\text{AcOH}$  and  $\text{CO}_2$ , and reduced to (I) and finally  $\text{EtCO}_2\text{H}$ . (II) is formed from  $\text{AcOH}$  and is converted into  $\text{EtCO}_2\text{H}$  and  $\text{CO}_2$ . An unknown fermentable compound is formed from  $\text{CO}_2$ .

F. O. H.

***Streptococcus lactis* variants not fermenting glucose.** E. S. YAWGER and J. M. SHERMAN (J. Dairy Sci., 1937, 20, 83–86).—Four cultures of *S. lactis* agreed in all respects with typical strains except in their inability to ferment lactose. One strain after 10 months' cultivation in milk gradually acquired the ability to ferment lactose.

W. L. D.

**Fermentative variability in substances of *Streptococcus cremoris* and *S. lactis*.** J. M. SHERMAN and R. V. HUSSONG (J. Dairy Sci., 1937, 20, 101–103).—Of 458 strains isolated from a pure culture of *S. cremoris* which did not ferment maltose or sucrose, 217 were maltose —, sucrose —, 229 were maltose +, sucrose —, and 11 were maltose —, sucrose +. *S. lactis* (maltose +, sucrose —) was more stable since only 1 out of 757 strains was maltose +, sucrose +.

W. L. D.

**Influence of temperature on growth and toxin production by *Clostridium botulinum*.** F. W. TANNER and E. W. OGLESBY (Food Res., 1936, 1, 481–494).—Data obtained with 7 strains of *C. botulinum* type A, 10 of type B, 1 of type C, and 3 untyped strains, 5 strains of *C. putrificum*, 7 of *C. sporogenes*, and one of *C. thermosaccharolyticum* are recorded. Spores require a higher temp. for germination than do actively growing cells for growth. Little growth occurs at 10° and none at 5°. Toxin is produced as soon as a heavy turbidity of growth is present.

E. C. S.

**Purification of *botulinus* toxin.** H. SOMMER (Proc. Soc. Exp. Biol. Med., 1937, 35, 520–521).—The toxin is pptd. by HCl from a peptic digest medium without dialysis and may be further purified by dissolution in  $\text{NaOAc}$  buffer and re-pptn. with 0.1N-HCl. The toxicity of the product may reach  $2 \times 10^{-7}$  g. per kg. mouse.

P. G. M.

**Reactions of staphylococci of the food-poisoning types in gelatin.** B. D. CHINN (Food Res., 1936, 1, 513–516).—The food-poisoning types cannot be differentiated by gelatin liquefaction (Stone's medium) from those isolated from infections. Culturing on starch agar increases the proportion of gelatin liquefiers of both types. The staphylococcus food-poisoning factor may be produced by some strains isolated from pathological lesions.

E. C. S.

**Identification of the pigment produced by diphtheria bacillus.** M. PAÍÓ (Compt. rend., 1937, 204, 298–300; cf. Stone and Coulter, A., 1932, 969; Ottensooser *et al.*, A., 1935, 787).—Absorption spectra show that diphtheria toxin broth contains coprohæmochromogen (the base probably being a purine). An  $\text{Et}_2\text{O}$  extract contains the Fe complex of coproporphyrin.

F. A. A.

**Effect of sulphur on development of tubercle bacilli and on experimental pulmonary tuberculosis.** A. CESTARI (Arch. Farm. speriment., 1936, 62, 204–226).—Aq. suspensions of S affect neither

the development nor virulence of cultures of human or bovine types of tubercle bacilli nor, when injected intratracheally, the course of the disease in guinea-pigs.

F. O. H.

**Infection by and resistance to the Preisz-Mocard bacillus.** IV. The toxin, the pyogenic action, and the lipin content of the bacillus. L. B. BULL and C. G. DICKINSON (Austral. Vet. J., 1935, 11, 126—138).—Prep. of the toxin is described. Addition of reducing agents (notably  $\text{NaHSO}_3$ ) increased the stability of the prep. Treatment of the toxic broth filtrate with 0.4% of colloidal Fe completely pptd. the toxin. K alum caused no pptn. The organism probably contains no chitin. Lipin extracted by org. solvents amounted to 15.9% of the dry wt., and a further 15.5% was obtained after alkaline hydrolysis of the residue. CH. ABS. (p)

**Biological properties of toxins produced by the Shiga and Flexner bacilli.** A. BOIVIN and L. MESROBEANU (Compt. rend., 1937, 204, 302—304; cf. A., 1936, 1423).—Filtrates from broth on which "smooth" Shiga bacilli have been cultivated at  $p_H$  8 give a ppt. with  $\text{CCl}_3\text{-CO}_2\text{H}$  at  $p_H$  3.5, which redissolves in aq.  $\text{Na}_2\text{CO}_3$  and contains the neurotropic principle (I), but none of the enterotropic principle (II). (I) is destroyed at  $100^\circ$ , is inactivated by trypsin, and flocculates with antidyenteric serum, but not with "smooth" Shiga antigen. The "rough" form of Shiga bacilli yields (I) but not (II), whilst the "smooth" form of Flexner bacilli yields (II) but not (I). The dysenteric bacilli also contain other thermolabile toxic principles. F. A. A.

**Serologically inactive polysaccharide from mucoid strains of group A hæmolytic streptococcus.** F. E. KENDALL, M. HEIDELBERGER, and M. H. DAWSON (J. Biol. Chem., 1937, 118, 61—69).—Group A (human pathogenic) hæmolytic streptococci produce in the mucoid phase a serologically inactive polysaccharide (I) similar to that from the so-called "smooth" ("mucoid") phase of pneumococci. Analytical data indicate (I) to consist of *N*-acetylglucosamine and glycuronic acid (1 : 1 mol.).

R. M. M. O.

**Specific and non-specific cell polysaccharides of a human strain (H-37) of tubercle bacillus.** M. HEIDELBERGER and A. E. O. MENZEL (J. Biol. Chem., 1937, 118, 79—100).—Fractionation of the polysaccharides (I) indicates the presence of serologically active and inactive (I) forms, two of which are characterised, one by its high positive  $[\alpha]$ , low pentose content, and presence of combined Mg palmitate, and the other by its low positive  $[\alpha]$  and relatively high pentose content. The fractions consist mainly of *d*-arabinose and *d*-mannose units.

R. M. M. O.

**Viantigen of *B. typhosus*.** G. BUONOMINI (Boll. Soc. ital. Biol. sperim., 1936, 11, 699—702).—The existence and characteristics of a viantigen (cf. Felix *et al.*, A., 1935, 1420) in some virulent strains of *B. typhosus* are discussed.

F. O. H.

**Ultra-violet absorption spectrum of crystalline tobacco mosaic virus protein.** G. I. LAVIN and W. M. STANLEY (J. Biol. Chem., 1937, 118, 269—

274).—The ultra-violet absorption spectrum of this protein consists of a broad band (max. at  $\lambda$  2650 Å.) made up of a no. of narrower bands, as yet incompletely resolved, and agrees with the destruction spectrum of the virus. The band attributed to tyrosine appears shifted towards the shorter  $\lambda\lambda$ .

F. A. A.

**Purification of suspensions of the virus of vaccinia by carbon dioxide.** C. A. BEHRENS and F. A. NIELSEN (Proc. Indiana Acad. Sci., 1934, 44, 100—117).—The method is based on the isoelectric pptn. of suspended tissue by  $\text{CO}_2$ . CH. ABS. (p)

**Relative *in vitro* activity of certain antiseptics in aqueous solution.** R. N. NYE (J. Amer. Med. Assoc., 1937, 108, 280—287).—A variety of antiseptics containing I, Cl, Hg, hexylresorcinol, listerine, etc. were tested simultaneously for bactericidal activity (both alone and in presence of 50% horse serum), diffusibility, and toxicity. An aq. solution of I is considered to possess more of the desirable properties of an antiseptic for use in wounds than any other solution tested.

P. W. C.

**Antiseptic power of mixtures of benzyl-dimethylalkylammonium chlorides.** C. G. DUNN (Proc. Soc. Exp. Biol. Med., 1936, 35, 427—429).—Gram-positive and -negative pathogenic organisms are readily destroyed in 10 min. at  $37^\circ$  by the mixtures (alkyl = radicals of the fatty acids of coconut oil) at dilutions of 1 : 35,000—1 : 90,000. The efficiency of the mixture is not affected by the presence of large concns. of org. matter and its germicidal power is not affected by freezing or heating at  $>50^\circ$  for 18 days.

W. McC.

**Effect of *p*-aminobenzenesulphonamide on organisms *in vitro*.** S. M. ROSENTHAL (U.S. Publ. Health Rep., 1937, 52, 192—196).—The compound in high dilutions is bacteriostatic and bactericidal to pneumococci but has no effect on the growth of streptococci.

W. L. D.

**Action of phenolic substances on bacteria. Influence of chemical constitution. Salicylic acid and alcohol, salicylaldehyde, and their mono- and di-halogeno-derivatives.** P. DELAUNEY (J. Pharm. Chim., 1937, [viii], 25, 254—266).—Methods for the determination of "antigenetic" (bacteriostatic) and "antibiotic" (bactericidal) activities of phenolic substances are discussed.

F. O. H.

**Bacteriostatic action of dyes with Gram-positive cocci.** J. E. FULLER and M. RUGOSA (Ann. Rept. Mass. Agric. Exp. Sta. [1934], Bull., 1935, No. 315, 22).—Basic fuchsin showed the greatest bacteriostatic effect on staphylococci, hæmolytic and non-hæmolytic streptococci, sarcinæ, and micrococci followed, in order, by crystal-violet and gentian-violet. Acid fuchsin had little action. High acid production by bacteria is associated with resistance to dyes.

CH. ABS. (p)

**Subconjunctival iron deposits after adrenaline injections.** T. GUNDERSON (Amer. J. Ophthalmol., 1934, 17, 807—808).—The black deposits remaining at the site of adrenaline injections consist of complex Fe salts, derived from dissolution of Fe from the

hypodermic needle by the aq. adrenaline hydrochloride ( $p_H$  5.6). CH. ABS. (e)

**Chemical determination of adrenaline.** J. DEVINE (Biochem. J., 1937, 31, 545—550).—The error in excess in the Folin determination of adrenaline (I) in adrenal extracts as compared with the oxidation method and the pressor assay is due to the ascorbic (II) and uric acid contents, chiefly (II). Error in the reverse direction is due probably to low  $p_H$ . The validity of the correction is limited by the sensitivity of the reagent to partly oxidised (II). Apart from the unidentified pyrocatechol compound present, no (I)-precursor was detected in the gland. P. W. C.

**Adrenaline and adrenochrome.**—See A., II, 207.

**Active crystalline substance, corticosterone, from adrenal cortex.** T. REICHSTEIN, E. LAQUEUR, I. E. UYLDERT, P. DE FREMERY, and R. W. SPANHOFF (Proc. K. Akad. Wetensch. Amsterdam, 1936, 39, 1218—1220).—A detailed account of work already noted (A., II, 105). F. O. H.

**Vitamin-C and the adrenal cortical hormone.** J. L. SVIRBELY and E. C. KENDALL (Amer. J. Physiol., 1936, 116, 187—193).—Adrenalectomised dogs given a diet free from vitamin-C and a const. amount of cortin (I) develop no scurvy and show no changes of N metabolism unless the dose of (I) is varied. (I) neither prevents nor delays scurvy in guinea-pigs, ascorbic acid being the main factor in this respect. R. N. C.

**Carbohydrate metabolism in adrenalectomised animals.** M. V. BUELL, I. A. ANDERSON, and M. B. STRAUSS (Amer. J. Physiol., 1936, 116, 274—281).—Adrenalectomy in rats reduces the rate of absorption of *D*-lactic acid (I) from the gastro-intestinal tract. Oral administration of salt mixture does not affect the lowered rate of absorption. Blood-sugar and liver-glycogen are low in adrenalectomised rats, whether or not they are protected by salt mixture or C adsorbate. The errors in carbohydrate metabolism resulting from adrenalectomy do not *per se* necessarily cause the rapid death of the animal protected by salt from excessive loss of  $H_2O$  and electrolytes. R. N. C.

**Intact and adrenalectomised dogs subjected to sodium and chloride depletion by intraperitoneal injections of glucose.** W. W. SWINGLE, W. M. PARKINS, and A. R. TAYLOR (Amer. J. Physiol., 1936, 116, 430—437). R. N. C.

**Relation of serum-sodium and -chloride levels to alterations of body-water in the intact and adrenalectomised dog, and the effect of adrenal cortical hormone on fluid distribution.** W. W. SWINGLE, W. M. PARKINS, A. R. TAYLOR, and H. W. HAYS (Amer. J. Physiol., 1936, 116, 438—445).—Intact and adrenalectomised animals receiving cortical hormone (I) can be maintained in normal health when serum-Na and -Cl have been depleted. (I) prevents symptoms of collapse in adrenalectomised animals by shifting tissue-fluids to the extracellular spaces and blood-stream, despite the low Na and Cl. (I) does not affect Na and Cl in the fasting state or on a salt-free diet. Urinary excretion of  $H_2O$ , Na, and Cl is low in adrenal insufficiency. In the intact animal, the glands

elaborate sufficient (I) to restore the fluid distribution to normal without affecting Na or Cl; supplementary injections of (I) reduce blood-urea-N to normal.

R. N. C.

**Effect of cortical extract on glucose tolerance of adrenalectomised and hypophysectomised rats.** H. A. BALL, L. T. SAMUELS, and H. F. SCHOTT (Proc. Soc. Exp. Biol. Med., 1937, 35, 633—634).—The decreased ability of hypophysectomised rats to remove sugar from the blood is unaffected by cortical extract, whilst that of adrenalectomised rats disappears.

P. G. M.

**Preparation and assay of adrenocorticotrophic hormone.** H. D. MOON (Proc. Soc. Exp. Biol. Med., 1937, 35, 649—652).—The hormone is prepared as described by Lyons (following abstract). A rat unit is defined as the amount necessary to produce a 50% increase in wt. of the adrenals of 21-day old male rats when administered in 3 daily doses, and is usually about 20 mg. The hormone contains no significant amounts of growth hormone.

P. G. M.

**Preparation and assay of mammotropic hormone.** W. R. LYONS (Proc. Soc. Exp. Biol. Med., 1937, 35, 645—648).—The hormone is extracted from sheep pituitaries with 85%  $COMe_2$  containing 2.5 vol.-% of HCl and pptd. from the clear extract with an equal vol. of  $COMe_2$ . It is purified by fractional pptn. from  $COMe_2-NH_3$  and dissolved in  $H_2O$  containing sufficient NaOH to give a clear solution. The ppt. produced by adjustment to  $p_H$  6.5 is discarded (adrenocorticotrophic fraction), and the mammotropic hormone is frozen out at  $p_H$  5.5 and assayed by the local intra-dermal "squab test."

P. G. M.

**Comparison of methods of extraction of the lactogenic hormone.** A. J. BERGMAN and C. W. TURNER (J. Biol. Chem., 1937, 118, 247—251).—For obtaining the lactogenic hormone from sheep anterior pituitary powder, extraction with 60—70% EtOH at  $p_H$  9—10 is the most efficient of the four methods tested.

F. A. A.

**Production of milk secretion in female and male dogs by anterior pituitary extract.** B. A. HOUSSAY (Rev. Soc. argentina biol., 1935, 11, 240—249).—Injection of the extract produced lactation in adult females which had never been pregnant and in those which had been castrated, hypophysectomised, and/or thyroidectomised or in which the splanchnic nerve had been cut, but not in young females. In male dogs in which the mammae were hypertrophied by prolonged administration of folliculin the extract induced lactation in whole or castrated animals.

CH. ABS. (p)

**Pancreas-stimulating hormone of the pituitary anterior lobe.** A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1937, 124, 823—826).—No evidence was obtained for the presence of a pancreas-stimulating hormone of the pituitary anterior lobe which increases the secretion of insulin.

H. G. R.

**Effect of hypophysectomy on pregnancy and lactation in dogs.** B. A. HOUSSAY (Rev. Soc. argentina biol., 1935, 11, 196—201).—Total hypophysectomy produces abortion without lactic secretion, or, if performed after normal parturition, it

rapidly decreases milk flow. The anterior lobe is necessary for lactic secretion. Extirpation of the posterior lobe does not affect pregnancy, parturition, or lactation. CH. ABS. (p)

**Effect of pituitrin on the composition of skeletal muscle.** S. OSADA (*Folia Endocrinol. Japon.*, 1935, 11, 23).—Injection of pituitrin increased the lactic acid and decreased the glycogen and lactacidogen contents of the muscle, the N constituents remaining unchanged. CH. ABS. (p)

**Augmentary factor in animal sera after injections of pituitary extract.** K. W. THOMPSON (*Proc. Soc. Exp. Biol. Med.*, 1937, 35, 640—644).—Injection of a gonadotropic extract of sheep pituitary induced the formation of a factor in the sera of horses and dogs which augmented threefold the activity of the extract in immature rats. The factor was present only in the pseudoglobulin fraction of the sera. P. G. M.

**Antigenic function of hormone preparations. I. Gonadotropic hormone of the anterior pituitary (prehormone).** F. EICHBAUM and V. KINDERMANN (*Z. Immunitäts.*, 1935, 86, 284—299; *Chem. Zentr.*, 1936, i, 3163).—By immunising rabbits with the prehormone from pregnancy urine, a sp. antibody is produced which is active not towards the hormone itself but towards the associated substances of the hormone in urine (urine antigen). A. G. P.

**Attempts to produce antigonadotropic substance by the use of serum or blood extract.** G. CHEN (*Chinese J. Physiol.*, 1937, 11, 329—333).—It is doubtful whether antigonadotropic effects can be produced by antisera but the gonadotropic effect of pituitary extract is reduced by injection of normal serum. H. G. R.

**Gonadotropic hormone in the blood and urine of early pregnancy. Normal occurrence of transient extremely high levels.** H. M. EVANS, C. L. KOHLS, and D. H. WONDER (*J. Amer. Med. Assoc.*, 1937, 108, 287—289).—Charts show the amount of gonadotropic hormone excreted in the urine throughout 6 normal pregnancies. Peak vals. occur 1 month from the beginning of the first expected but missed menstruation. P. W. C.

**Female sex hormones.** L. FRAENKEL (*Chinese Med. J.*, 1937, 51, 325—340).—A lecture.

**Dependence of oestrone production during pregnancy on the sex of the foetus and size of the placenta.** L. GRAM (*Biochem. Z.*, 1937, 289, 397—405).—In women during the last two months of pregnancy there is no correlation between the extent of urinary oestrone (I) excretion and the sex of the foetus. With female foetuses, the amount of (I) excreted is slightly > that excreted with male foetuses although the placentas [which contain approx. the same concn. of (I) with both sexes] are smaller with the females than with the males. W. McC.

**Optimal dosage of oestrogens. Experimental and clinical evaluation.** C. MAZER and S. L. ISRAEL (*J. Amer. Med. Assoc.*, 1937, 108, 163—169).—The rate of absorption and excretion of oestrogen following hypodermic or oral administration of oily

solutions of oestradiol benzoate (I), oestradiol, theelin (II), and theelol to ovariectomised women for 1—10 days is investigated. A single dose of 1000 rat units of (I) or (II) maintain the normal level of oestrogen in the blood for 4 days. With larger doses (5000—10,000 units) the normal premenstrual level is attained on the 4th—5th day. The degree of absorption as reflected in the blood and urine levels varies considerably with the product and the amount administered, hypodermic administration being only twice as effective as the oral route. P. W. C.

**Report of the 2nd Conference on the standardisation of the sexual hormone.** ANON. (*Bull. trimestr. Organisat. Hyg.*, 1935, 4, 631—643; *Chem. Zentr.*, 1936, i, 2962).—Physical and biological standards are established for the monobenzoate of oestradiol, androsterone, and progesterone. A. G. P.

**Occurrence of folliculin in the male organism.** B. FRATTINI (*Boll. Soc. ital. Biol. sperim.*, 1936, 11, 853—855).—The presence of folliculin in stallion's urine is confirmed by the action of preps. from the urine on the uterus and pituitary gland of ovariectomised rats. F. O. H.

**Sexual hormones.** XX, XXI.—See A., II, 199.

**Biochemical transformation of  $\Delta^1$ -androstenedione into  $\Delta^4$ -testosterone.**—See A., II, 199.

**Effect of  $\Delta^4$ -androstenedione and  $\Delta^5$ -androstenediol on castrated and ovariectomised rats.** V. KORENCHESKY, M. DENNISON, and M. ELDRIDGE (*Biochem. J.*, 1937, 31, 467—474).—Both  $\Delta^4$ -androstenedione (I) and  $\Delta^5$ -androstenediol (II) restore the wt., size, and histological structure of rat organs atrophied after gonadectomy towards but not up to normal and raise the wt. and size of both male and female preputial glands to normal or > normal. In the doses used, (I) shows a co-operative activity with oestrone (III) on the female organs only, whilst (II) shows no co-operative activity with (III) on the male or female organs but opposes the action of (III) on some female sexual organs. There is co-operative activity on the male sexual glands between (I) and testosterone. Both (I) and (II) cause a decrease in wt. of adrenals and an increase in the rate of involution of the thymus in both castrated and ovariectomised rats [except that in males the effect of (II) on the thymus is indefinite]. Addition of (III) seems to depress the action on the adrenals. The effect of (I) and (II) on other organs, fat deposition, and gain in body-wt. is discussed. P. W. C.

**Prolonged treatment of castrated and ovariectomised rats with testosterone propionate.** V. KORENCHESKY, M. DENNISON, and M. ELDRIDGE (*Biochem. J.*, 1937, 31, 475—485).—Testosterone propionate (I) injected into castrated male rats causes complete recovery to normal wt. of the atrophied sexual organs, a decrease in wt. of the "castration" adrenals and thymus, a slight increase in the wt. of kidneys and liver, an improvement with small doses in gain in body-wt., and a lasting decrease with large doses. The activity of (I) is > that of testosterone (II) and the changes are to some extent (sexual organs) or completely (adrenals) maintained 9 days after the last injection. All the male hormones

used stimulate the development of atrophied female sexual glands but (I) is more active even than oestrone (III) in the doses used. (I) increases the wt. of the uterus nearly to normal when injected alone and to normal in combination with (III), produces abnormally large vagina and female preputial glands, decreases the wt. of the adrenals, greatly increases the rate of involution of the thymus, and decreases fat deposition and gain in body-wt. The histological changes in uterus and vagina are similar to those with androstenediol or with (II).  
P. W. C.

**Capon comb growth-promoting substances ("male hormones") in human urine of males and females of varying ages.** E. DINGEMANSE, H. BORCHARDT, and E. LAQUEUR (*Biochem. J.*, 1937, 31, 500—507).—H<sub>2</sub>O-sol. forms (esters) of male hormone exist in all the urines examined; they cause no growth of the capon comb but can be hydrolysed with acid or by heating under pressure, but not with alkali or by keeping at room temp., in which respect they differ from oestrogenic substances. The urine of men up to 40 years usually contains 40—50 units per litre (women 30—60 units per litre). Before puberty boys excrete about 15 units per litre (girls 5 units per litre). An increase of "male hormone" excretion occurs during the post-menstrual period. It is unlikely that the hormone excreted has its origin in the food.  
P. G. M.

**Effect of endocrine glands on composition of skeletal muscle. IV. Effect of the testis. V. Effect of the ovary.** G. OSADA (*Folia Endocrinol. Japon.*, 1935, 11, 21—22, 22—23; cf. this vol., 42).—IV. Oral administration of testis powder increased the residual N, NH<sub>3</sub>, urea, creatine (I), NH<sub>2</sub>- and lactic (II) acids in the muscle, decreased glycogen (III) and lactacidogen (IV), but did not affect the creatinine content. Castration decreased (II) and increased (III) and (IV), the N and creatinine (V) fractions being unchanged.

V. Oral administration of interstitial tissue powder increased the (I) and (II) contents and all N fractions in the muscle and decreased (III) and (IV). Administration of corpus luteum powder decreased (I), (II), urea, and residual N and increased (III) and (IV). Oophorectomy acted similarly except that residual N and urea were unchanged. Neither treatment affected the (V) content.

CH. ABS. (p)

**Insulin hypoglycæmia. I. Action of sulphur. II. Hyperinsulinæmia in pigeons.** C. FORTI (*Boll. Soc. ital. Biol. sperim.*, 1936, 11, 915—916, 916—917).—I. The fall in blood-sugar due to injection of insulin (I) into rabbits rendered febrile by subcutaneous injection of suspensions of S has a rapidity and intensity < normal.

II. The injection of blood (1.5 c.c.) from a pigeon that had received, 1.5 hr. previously, 24.6 units of (I) per 100 g. body-wt. into a rabbit had no effect on the blood-sugar of the latter. With pigeons receiving 95.2 units of (I) per 100 g., the blood after 7—35 min. produced a slight hypoglycæmia (fall of 0.018—0.020%) in rabbits.  
F. O. H.

**Site and mechanism of the antiketogenic action of insulin.** I. A. MIRSKEY (*Amer. J. Physiol.*,

1936, 116, 322—326).—Simultaneous administration to rabbits of insulin (I) with neutralised alkaline extract of the anterior pituitary (II) inhibits the ketogenic action of (II); preliminary administration of ergotamine (III) has the same effect. Since (II) is effective only in presence of the liver, it is probable that (I) and (III) exert their antiketogenic effects on the liver. The action of (I) and (III) is possibly due to their antiglycogenolytic function.  
R. N. C.

**Injury to heart muscle by insulin.** E. SCHONBRUNNER (*Med. Klin.*, 1935, 31, 1571—1572; *Chem. Zentr.*, 1936, i, 3165—3166).—In certain cases of hyperglycæmia insulin injured the heart muscle without producing very great diminution of blood-sugar.  
A. G. P.

**Dietetic factor determining glucose tolerance and sensitivity to insulin in healthy men.** H. P. HIMSWORTH (*Clin. Sci.*, 1935, 2, No. 1, 67—94).—The area above the resting blood-sugar level or below the insulin depression curve is const. provided the diet is unchanged. Improvement in glucose (I) tolerance following transition from low-carbohydrate, high-fat to high-carbohydrate, low-fat diets is due solely to the carbohydrate. Changes in (I) tolerance may be explained by changes in pancreatic insulin secretion, sensitivity increasing with the carbohydrate intake.  
CH. ABS. (p)

**Physical and physiological properties of the system insulin-tannic acid.** F. BISCHOFF (*Amer. J. Physiol.*, 1936, 116, 239—244).—Insulin (I) is pptd. by tannic acid (II) on both sides of the isoelectric point, and the *p*<sub>H</sub> of solution becomes approx. 7.0; in low concns. of electrolytes a colloidal solution forms, which is broken by NaCl. (I) administered parenterally in combination with (II) prolongs resorption, increasing the physiological effect.

R. N. C.

**Cutaneous absorption of insulin.** M. BRUGER and J. FLEXNER (*Proc. Soc. Exp. Biol. Med.*, 1936, 35, 429—432).—In rabbits insulin is absorbed through recently abraded but not through intact skin.

W. McC.

**Cystine content of insulin.** G. L. MILLER and V. DU VIGNEAUD (*J. Biol. Chem.*, 1937, 118, 101—110).—The S content of dry ash-free cryst. insulin (I) is 3.34±0.03% and the cystine (II) content, determined after hydrolysis with 50% HCO<sub>2</sub>H containing 20% of HCl, is 12.5±0.4%. Hence all but a trace of the S is present as (II). Perfectly dry (I) is very hygroscopic and is freed from H<sub>2</sub>O only with difficulty.

W. McC.

**Distribution of sulphur in crystalline insulin.** B. KASELL and E. BRAND (*Proc. Soc. Exp. Biol. Med.*, 1936, 35, 444—445).—In insulin yielding 11% of cystine (I) and 0.7% of methionine (II) on hydrolysis, 94% of the S is present in (I) and 5% in (II).

W. McC.

**Retarded and prolonged action of insulin precipitated by safranin.** H. R. JACOBS and H. T. RICKETTS (*Proc. Soc. Exp. Biol. Med.*, 1936, 35, 473—477).—The suspension obtained by pptg. insulin at *p*<sub>H</sub> 7.2 in presence of safranin *O* resembles but is somewhat less effective than protamine-insulin in causing hypoglycæmia of gradual onset and ex-

tended duration. With both materials the redissolution of the suspended material lowers its efficiency.

W. McC.

**Influence of oestrus, pregnancy, and lactation on the development of tetany and on the blood-calcium in dogs with hypoparathyroidism.** F. MATHIEU (Compt. rend. Soc. Biol., 1937, 124, 855—858).—In oestrus, the latent tetany develops and the blood-Ca decreases to a level which becomes const. some months after the operation. Tetany and decreased blood-Ca were present towards the end of pregnancy and in the early stages of lactation, relieved to some extent in the latter case by a diet rich in milk.

H. G. R.

**Calcium and phosphorus content of the milk of dogs suffering from hypoparathyroidism.** F. MATHIEU (Compt. rend. Soc. Biol., 1937, 124, 859—861).—Ca and P in the milk are decreased in latent tetany. If a milk diet is substituted by a flesh diet, the Ca decreases sharply and then rises slightly whilst the P is not affected, these variations not being observed in normal dogs.

H. G. R.

**Effect of administration of parathyroid extract on serum-calcium level in the nephrectomised rat.** W. R. TWEEDY and E. W. McNAMARA (Proc. Soc. Exp. Biol. Med., 1936, 35, 414—416).—In immature and mature rats nephrectomy causes a slight decrease in serum-Ca, which is only slightly increased by subsequent injection of large doses of parathyroid extract.

W. McC.

**Effect of thyroxine on the rate of oxidation of alcohol in the dog.** J. BENEDICT and K. MEZEY (Biochem. Z., 1937, 289, 432—435).—In dogs on a diet of 300 g. of meat + 100 g. of bread, the rate of oxidation of EtOH given orally in doses of 0.5 g. per kg. exhibits wide variations. The rate is not affected by daily subcutaneously injecting 1 or 4 mg. of thyroxine.

W. McC.

**Action of thyroxine and similar substances on the development of sea-urchin larvæ.** M. R. ZERLING (Bull. inst. oceanograph., 1935, No. 678, 10 pp.).—Thyroxine (1 in 50,000—800,000) retards growth and differentiation in the larvæ after the first mitotic division. Chemically related substances are without effect.

CH. ABS. (*p*)

**Relation between the thyroid and the diencephalic gland.** E. SCHARER and R. GAUPP (Klin. Woch., 1935, 1651—1652; Chem. Zentr., 1936, i, 2964).—It is premature to associate production of the thyrotropic hormone with the diencephalic gland. In amphibia the gland contains the hormone.

A. G. P.

**Non-specificity of thyrotropic antihormone.** K. W. THOMPSON (Proc. Soc. Exp. Biol. Med., 1937, 35, 637—640).—Injections of a sheep pituitary extract into a bitch produced an antihormone which inactivated in guinea-pigs a thyrotropic hormone prep. from sheep and ox pituitaries and human urine of myxoedema.

P. G. M.

**Active agents in nature.** R. KUHN (Naturwiss., 1937, 25, 225—231).—A lecture.

**Cutaneous absorption of vitamins, particularly from vitamin-containing skin creams.** M.

SCHIEBLICH (Fette u. Seifen, 1937, 44, 64—67).—A review.

F. C. B. M.

**Fat-soluble vitamins. I. Nature and importance of vitamins.** W. HALDEN (Fette u. Seifen, 1937, 44, 62—64).—A review.

F. C. B. M.

**Formation of gallstone. I. Influence of fat-soluble vitamins, especially vitamin-A (cod-liver oil and "biostearin"), on amounts of potassium, sodium, calcium, and magnesium in blood.** T. MARUO (Japan. J. Gastroenterol., 1935, 7, 120—124).—In rabbits fed with cod-liver oil or olive oil and injected with biostearin, serum-Ca and -Na decreased, whereas -Mg and -K increased. Changes are ascribed to excess of vitamin-A.

CH. ABS. (*p*)

**Lipin-soluble factors necessary for the growth of *Drosophila melanogaster*.** Meig. M. LAFON (Compt. rend. Soc. Biol., 1937, 124, 798—800).—*Drosophila* grows normally on a medium devoid of the fat-sol. vitamins.

H. G. R.

**Water-soluble factors necessary for the growth of *Drosophila melanogaster*.** Meig. M. LAFON (Compt. rend. Soc. Biol., 1937, 124, 800—803).—*Drosophila* requires a factor (not present in hen's eggs) for normal growth but does not need the vitamins, whilst *Lucilia sericata* requires several of the H<sub>2</sub>O-sol. factors.

H. G. R.

**Biochemistry of vitamin-A. State of combination in liver oils.** L. RETY (Rev. Soc. Argentina biol., 1935, 11, 283—290).—In livers of fish, chicken, and mammals -A was combined with fatty acids.

CH. ABS. (*p*)

**Distribution of vitamin-A in the tissues of the eels *Anguilla vulgaris* and *A. aucklandi*.** Rich. J. R. EDISBURY, J. A. LOVERN, and R. A. MORTON (Biochem. J., 1937, 31, 416—423).—Vitamin-A occurs in the liver and also in other tissues. The content tends to increase with age. The liver oil, which is scanty, is rich in -A. Non-liver oils from the conger eel, sturgeon, halibut, herring, and lamprey contain appreciable amounts of -A.

F. O. H.

**Vitamin-A requirements of the rat.** D. GREAVES and C. L. A. SCHMIDT (Amer. J. Physiol., 1936, 116, 456—467).—The vitamin-A requirements are unaffected by laparotomy, but are increased by choledocholonomostomy, which, however, does not increase liver-A. -A is not excreted in the bile. Icterus does not affect the -A requirements, but reduces the amount absorbed from the intestines. The -A requirements are unaffected by age or body-wt., and are not associated with the ovary, but are increased by administration of thyroid or thyroxine, and reduced by thyroidectomy.

R. N. C.

**Vitamin-A deficiency: studies with the visual photometer.** I. O. PARK (J. Oklahoma State Med. Assoc., 1935, 28, No. 10, 357—364).—Low vitamin-A intake is associated with the production of rhodopsin. -A is possibly destroyed by the toxin of measles. Administration of carotene was beneficial in a no. of diseases.

CH. ABS. (*p*)

**Melanin pigment of the skin and conjunctiva in avitaminosis-A in man.** J. W. MU, C. N. FRAZIER, and A. PILLAT (Chinese J. Physiol., 1937,

11, 247—252).—The skin and conjunctiva in avitaminosis-*A* contain melanin-producing enzymes and melanin pigment, the latter being most marked where the epithelium is thickened and infiltration of leucocytes present.

H. G. R.

**Vitamin-B complex. I. Effect of fats and of individual esters on vitamin-B requirement of rats.** W. D. SALMON and J. G. GOODMAN. **II. Quantity of glycogen in the vitamin-deficient rat and its ability to deplete this glycogen during starvation.** **III. Ability of the vitamin-deficient rat to utilise lactic acid.** **IV. Apparent ability of the vitamin-B-deficient rat to transform carbohydrate into fat.** G. A. SCHRADER (45th Ann. Rept. Alabama Agric. Exp. Sta., 1934, 21—22).—I. With diets containing Et or glyceryl esters equiv. to 23% of the fatty acid, the vitamin-B-sparing efficiency of the acids was in the descending order octoic (I), decoic (II), heptoic (III), lauric (IV), myristic, nonoic, undecoic, and oleic.  $\text{BuCO}_2\text{H}$ ,  $\text{EtCO}_2\text{H}$ , and  $\text{AcOH}$  had little, and palmitic and stearic acid no, sparing effect. Glyceryl butyrate was toxic even when the diet contained adequate -*B*. Spastic cases of -*B* deficiency were remedied by administering (I), (II), (III), or (IV) without -*B*. The onset of -*B* deficiency is not hastened by substituting 23% of glyceryl lactate for sucrose in the diet.

II. The accumulation of glycogen and the rate of its depletion were similar in -*B*-deficient and normal rats.

III. Utilisation of lactic acid was  $\ll$  that of *d*-glucose. There was no apparent breakdown of lactic acid metabolism in -*B*-deficient rats.

IV. On high-carbohydrate diets all -*B*-deficient rats showed R.Q. 1.26. On high-fat diets the R.Q. was always  $<1.0$ . Rats receiving a high-carbohydrate diet can convert carbohydrate into fat.

CH. ABS. (p)

**"Orizotoxin" and experimental beri-beri in pigeons.** G. SOLARINO (Quad. Nutriz., 1935, 1, 375—412; Chem. Zentr., 1936, i, 2967).—Administration of EtOH-extracts of polished or autoclaved rice to fasting pigeons causes beri-beri and death. The same is produced, though to a smaller extent, by feeding maize. Supplementary feeding with vitamin-B corrects this action. The presence of an EtOH-sol. orizotoxin is established.

A. G. P.

**Vitamin-B<sub>1</sub> in the animal organism. I. Maximum storage of vitamin-B<sub>1</sub> in the rats' tissues.** **II. Metabolism of vitamin-B<sub>1</sub> in rats.** P. C. LEONG (Biochem. J., 1937, 31, 367—372, 373—384).—I. Data for the distribution of vitamin-B<sub>1</sub> in various tissues of rats on diets of varying content of -*B*<sub>1</sub> are tabulated. The richest stores are the liver and heart whilst the total storage in muscle and liver is 50 and 35%, respectively, of the total reserves. Max. storage occurs with an intake of -*B*<sub>1</sub> of approx. 30 international units per day.

II. With rats on varying intakes of -*B*<sub>1</sub>, the bacterial synthesis of -*B*<sub>1</sub> in the intestines is small. Faecal excretion of -*B*<sub>1</sub> is not significant for daily intakes of  $<30$  units, but with  $>30$  units the faecal resembles the general urinary excretion in increasing with increased intake. With -*B*<sub>1</sub>-deficient diets, approx. 2

units are daily withdrawn from the reserves. Injection of large doses of -*B*<sub>1</sub> is followed by excretion (almost totally urinary) of 75%. High dosage of -*B*<sub>1</sub> is followed by metabolic destruction of approx. 30 units per day.

F. O. H.

**Crystalline vitamin-B<sub>1</sub>.**—See A., II, 212.

**Synthesis of aneurin.**—See A., II, 216.

**Fractionation of the vitamin-B<sub>2</sub> complex from various sources.** N. HALLIDAY and H. M. EVANS (J. Biol. Chem., 1937, 118, 255—267).—A method for the assay of vitamin-B<sub>2</sub> potency on rats is described, and results are given for several materials, extracted in various ways. The results confirm that there is a liver "filtrate factor" (I) distinct from -*B*<sub>2</sub>. -*B*<sub>2</sub> may be adsorbed on fuller's earth at  $p_{\text{H}}$  1—2 and eluted with aq.  $\text{Ba(OH)}_2$  with little loss. -*B*<sub>2</sub> survives autoclaving at  $p_{\text{H}}$  9, and ultra-violet irradiation, but its activity disappears on storage. Both -*B*<sub>2</sub> and (I) dialyse.

F. A. A.

**Effect of diet and various substances on the vitamin-C content of some organs of the rat.** J. L. SVIRBELY (Amer. J. Physiol., 1936, 116, 446—455).—The composition of the diet does not affect the ability to synthesise ascorbic acid (I). Utilisation of (I) by the tissues is increased by thyroid or 2:4-dinitrophenol. NaF given with thyroid reduces the (I) content of the organs. (I) is low in the tissues of rats brought to the point of collapse by excessive thyroid feeding. Cinchophen or etherisation reduces liver-(I). The small intestine is capable of yielding primary precursors for synthesis of (I) and can adjust itself to cope with any dietary condition. Animals exposed to  $\text{CCl}_4$  vapour, or with fatty livers, can still synthesise appreciable quantities of (I).

R. N. C.

**Ascorbic acid oxidase and the state of ascorbic acid in vegetable tissues.** W. STONE (Biochem. J., 1937, 31, 508—512).—Vegetables which lose their indophenol-reducing power on mincing oxidise the ascorbic acid (I) of orange juice, whilst those which retain their (I) content contain no oxidase. The enzyme catalyses the conversion of (I) into dehydro-ascorbic acid (II), which is quantitatively reduced again to (I) by  $\text{H}_2\text{S}$ . (II) is formed only when the minced vegetable is exposed to air.

P. G. M.

**Ascorbic acid and the function of the adrenal cortex.** R. TISLOWITZ (Klin. Woch., 1935, 14, 1641—1646; Chem. Zentr., 1936, i, 2964).—Intravenous injection of ascorbic acid (I) had no influence on the blood-cholesterol level in normal dogs or after unilateral adrenalectomy. (I) diminishes the action of adrenal extracts on blood circulation and increases diuresis in adrenalectomised, but less definitely in normal, animals.

A. G. P.

**Effect of diphtheria toxin on vitamin-C in adrenals of guinea-pigs.** C. C. TORRANCE (Proc. Soc. Exp. Biol. Med., 1937, 35, 654—655).—The ascorbic acid (I) content of the adrenals of guinea-pigs (230—280 g.) injected with  $\frac{1}{3}$  of the lethal dose of diphtheria toxin was 60%  $>$  that of controls, when killed 24 hr. after injection. After 4 days necrosis was present at the site of injection and the (I) content of the adrenals was 270%  $>$  that of controls.

P. G. M.

**Vitamin-C. II. Vitamin-C contents of the liver and muscle of some Indian fresh-water fish.** M. N. RUDRA (J. Indian Chem. Soc., 1936, 13, 740—742).—The vitamin-C content of some Indian fresh-water fish is highest in the liver and lowest in the muscle (cf. A., 1936, 766); the tissues of the younger fish are richer in -C than those of bigger fish of the same variety.

F. R. S.

**Vitamin-C content of foods available for young infants.** C. SUNG and F. T. CHU (Chinese Med. J., 1937, 51, 315—324).—The vitamin-C content (0.004%) of human milk is normally 4 times that of cow's milk but with unsuitable feeding the two vals. approximate. Cabbage has the highest -C content of the leafy vegetables examined. Tomato, turnip, kohl-rabi, and orange juice are suitable sources of -C, whilst soya-bean milk is a poor source.

P. G. M.

**Stability of vitamin-C and absence of ascorbic acid oxidase in citrus fruits and milk.** H. TAUBER (Proc. Soc. Exp. Biol. Med., 1936, 35, 422—423).—The juice of oranges, tangerines, and lemons contains no ascorbic acid oxidase and cow's milk contains  $\approx$  traces.

W. McC.

**Electric charge on [dry] vitamin-C.** G. GAL-  
LERANI (Boll. Soc. ital. Biol. sperim., 1936, 11, 815—817).—Evidence of both positive and negative charges was obtained.

F. O. H.

**Vitamin-C as catalyst for synthesis of carbon chains.**—See A., II, 176.

**Nature and properties of the dienolic group of vitamin-C.**—See A., II, 176.

**Oxidation-reduction potential of ascorbic acid.**—See A., I, 246.

**Oxidation-reduction. Ascorbic acid.**—See A., I, 246

**Synthesis of vitamin-C.**—See A., II, 176.

**Scorbaric acid.**—See A., II, 180.

**Deterioration of vitamin-D in aqueous solution.** D. H. SHELLING (Proc. Soc. Exp. Biol. Med., 1937, 35, 660—663).—Solutions of vitamin-D which originally assayed 500 International units per g. contained, after 6 months at 0° in tightly stoppered bottles, <40 units per g. Little deterioration occurred when the emulsions were kept under N<sub>2</sub> instead of air.

P. G. M.

**Absence of vitamin-E from the royal jelly of bees.** K. E. MASON and R. M. MELAMPY (Proc. Soc. Exp. Biol. Med., 1936, 35, 459—463).—The jelly, consumed by vitamin-E-deficient female rats in amounts of  $\approx$  1 g. daily during pregnancy, does not cause completion of gestation (cf. Hill and Burdett, A., 1932, 1295).

W. McC.

**Interrelationship between dietary egg-white and the requirement for a protective factor in the cure for the nutritive disorder due to egg-white.** H. T. PARSONS, J. G. LEASE, and E. Kelly (Biochem. J., 1937, 31, 424—432).—The protective factor (I) (Lease, A., 1936, 765) is not identical with any known factor of the vitamin-B complex. The nutritive disorder appears not to be due to destruction

or metabolic interference of (I) by the egg-white constituents whilst the proportionality between concn. of egg-white in the diet and the necessity for (I) indicates an interrelationship of a metabolic nature. The requirement for (I) in chicks is  $>$  that in rats.

F. O. H.

**Biochemical basis in plant breeding.** N. N. IVANOV (Theor. Bases of Plant Breeding, Lenin Acad. Agric. Sci., 1935, 1, 991—1016).—A discussion.

CH. ABS. (p)

**Breeding for chemical composition.** N. A. BAZILEVSKAJA (Theor. Bases of Plant Breeding, Lenin Acad. Agric. Sci., 1935, 1, 1017—1043).—A general résumé.

CH. ABS. (p)

**Water fixed by marine algæ *in vivo*.** L. P. BOUTHILLIER and G. GOSSELIN (Natural Canad., 1937, 64, 65—80).—*Fucus vesiculosus* and *F. platycarpus* fix approx. 0.57 g. of H<sub>2</sub>O per g. of dry matter, the val. being in inverse relation to the salinity of the medium.

H. G. R.

**Technique of the refractometric determination of bound water in plants.** V. P. POPOV (Kolloid. Shurn., 1936, 2, 855—861).—Negative adsorption of sucrose from H<sub>2</sub>O by wheat under various conditions was measured.

J. J. B.

**Accumulation of citric acid in Makhorka (*Nicotiana rustica*, L.).** S. O. GREBINSKI (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 139—142).—Girdling of the plants increases the carbohydrate and decreases the ash, Ca, total N, nicotine, and citric acid contents. "Low topping" increases the last three.

A. L.

**Contents of protein substances and of phytin in the seeds of cereals during their development.** L. MARIMPIETRI (Ann. R. Staz. Chim.-Agrar. Sperim., 1933, II, 14, No. 302, 19 pp.).—After the first stages of development the total N content diminishes considerably. During the waxy phase vals. are const. or increase slightly. The quotient gliadin-N (I)/glutenin-N (II) remains const., whilst those of (I) + (II)/total N and phytin-P/total P increase considerably.

E. P.

**Structure of the wall of the green alga *Valonia ventricosa*.** R. D. PRESTON and W. T. ASTBURY (Proc. Roy. Soc., 1937, B, 122, 76—97).—Detailed examination of the cell wall of *V. ventricosa* by X-rays and by the polarising microscope is described. In alternate layers, the cellulose chains fall along meridians and along spirals terminating at the poles. The chains in successive layers cross at an angle of about 83°, and their directions correspond with the striations of the cell wall.

F. A. A.

**Effect of toxic salts on regeneration of the nucleus in the lupin.** G. DELOFFRE (Compt. rend. Soc. Biol., 1937, 124, 778—780).—CdCl<sub>2</sub> and HgCl<sub>2</sub> retard the regeneration of the nucleus and nucleolus of the hypocotyls between two limits of concn., above which necrosis sets in.

H. G. R.

**Tumours of a neoplastic character formed on plants by the action of  $\beta$ -indolylacetic acid.** T. SOLACOLU and D. CONSTANTINESCO (Compt. rend., 1937, 204, 290—292; cf. A., 1936, 1433).—Various

changes of botanical structure following the injection and application as a paste of  $\beta$ -indolylacetic acid to *Abutilon avicennae*, Gr., *Ricinus communis*, L., and *Helianthus annuus*, L., are described; these include the formation of tumours resembling those produced by neoplastic agents, and, in *R. communis*, the production of anthocyanin pigments in the pith.

F. A. A.

**Alkaline extract of the anterior pituitary and (A) germination, (B) plant growth.** E. PASCAL (Soc. biol. Rosario, 1934, [Nov. 24]).—(A) The extract accelerated germination of certain seeds.

(B) Extracts accelerated the growth of certain plants but were ineffective with others. Acceleration was most marked during the first few days of growth. Large doses were toxic. CH. ABS. (p)

**Inducement of fruit development by growth-promoting chemicals.**—See B., 1937, 377.

**Solid sugars from Mohuwa flower syrup.** D. G. WALAWALKAR (J. Indian Chem. Soc., 1936, 13, 657—658).—The aq. extract of Mohuwa (*Bassia latifolia*) flowers gives solid sugars only when mixed with 2 parts of 84° Brix sugar and thus probably contains higher saccharides and not sucrose as hitherto supposed. R. S. C

**Constituents of the leaves of *Vitex negundo*.** T. P. GHOSE and S. KRISHNA (J. Indian Chem. Soc., 1936, 13, 634—640).—The leaves of *V. negundo*, Linn., collected in Sept.—Oct., contain 0.03% of an amorphous alkaloid and yield to EtOH  $p$ -OH-C<sub>6</sub>H<sub>4</sub>·CO<sub>2</sub>H (I) (0.3%), 3:4-(OH)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>·CO<sub>2</sub>H (II), 5-hydroxyisophthalic and tannic acid, a *glucononitol*, m.p. 196—198°,  $[\alpha]^{20} +1.5^\circ$  in H<sub>2</sub>O (Ac derivative, m.p. 179—180°), and an amorphous, sol. glucoside (0.74%), m.p. 93—95°, hydrolysed by hot 5% H<sub>2</sub>SO<sub>4</sub> or NaOMe to glucose and (I). Leaves collected in Feb.—March yield to EtOH (I), (II), and a *glucoside* (III), ? C<sub>20</sub>H<sub>24</sub>O<sub>11</sub>, m.p. 154—155°,  $[\alpha]^{20} -92.6^\circ$  in abs. EtOH (reddish-violet FeCl<sub>3</sub> colour), which with dil. AcOH or hot H<sub>2</sub>O gives (I), glucose, and an amorphous substance. With cold H<sub>2</sub>SO<sub>4</sub>-EtOH (III) gives glucose (42%) and acidic and neutral substances, which with hot 2% H<sub>2</sub>SO<sub>4</sub> give (I) and a *substance* (Br<sub>x</sub>-derivative, m.p. 92—93°). (III) and hot 5% KOH-EtOH give (I) and a *glucoside*, ? C<sub>13</sub>H<sub>20</sub>O<sub>9</sub>, m.p. 173—174°,  $[\alpha]^{20} -163.6^\circ$  in H<sub>2</sub>O, which with dil. H<sub>2</sub>SO<sub>4</sub> gives glucose (58%) and an amorphous substance, but no (I). The vermifugal action of the leaves is due to the (I) content. R. S. C.

**Biological determination of glucosides in *Adonis vernalis*.** F. MERCIER and S. MACARY (Compt. rend. Soc. Biol., 1937, 124, 745—748).—Adonioside has an ouabain- and adonivernoside a digitalin-like action. H. G. R.

**Gaultherioside (ethylprimveroside). Biochemical synthesis.** J. RABATE (Compt. rend., 1937, 204, 153—155).—Gaultherioside (A., 1931, 1100) does not exist in the tissues of *Gaultheria* but is formed by the interaction of EtOH (used in the extraction) with primverose liberated from monotroposide by the leaf-enzymes (A., 1935, 1042). F. O. H

**Constituents of *Cosmos bipinnatus*, Cav.**—See A., II, 179.

**Nature and occurrence of the primary substance in the cell walls of vegetable tissue.** J. GUNDERMANN, W. WERGIN, and K. HESS (Ber., 1937, 70, [B], 517—526).—Comparison of the X-ray diagrams of the primary material (I) of young cotton hairs and those of carnauba wax, stearic acid, and paraffin wax, m.p. 56—58°, shows the wax-like nature of (I) in which the components C<sub>30</sub>, C<sub>32</sub>, and C<sub>34</sub> appear more copiously present than in the similar product from the older hairs. Fat wax appears to be present within the cell in small amount or in a distribution which is not detected by X-ray analysis so that that observed in this manner is definitely a component of the cell wall. The diagram also establishes the appearance of cellulose at an early stage of growth. The subsequent disappearance of the interferences of (I) is not due to destruction of (I) but to its decrease in proportion to the total cell material until in the ripe hairs it constitutes only 0.2—0.3% of the mass. The wax of the young cell walls is not a product of the ageing cells and is not secreted with the object of protecting the epidermis of the plant organs from external influences. It is not confined to the cells of the epidermis but is present at the beginning of the development of the cell wall and is closely concerned with the first and decisive processes in the formation of the cells. H. W.

**Fats of sea algæ. II.** E. TAKAHASHI, K. SHIRAHAMA, and S. TASE (J. Chem. Soc. Japan, 1935, 56, 1250—1257).—Palmitic with smaller amounts of stearic and myristic acids were the principal saturated acids. Unsaturated acids included oleic acid, C<sub>15</sub>H<sub>23</sub>O<sub>2</sub>, and C<sub>15</sub>H<sub>30</sub>O<sub>2</sub>. CH. ABS. (p)

**Composition of the chinaberry.** R. W. BOST and D. FORE, jun. (J. Elisha Mitchell Sci. Soc., 1935, 51, 134—142).—Fruits of *Melia azedarach* contain a semi-drying oil, glucose, protein, and an unidentified toxic substance. The oil consists largely of glycerides of palmitic, oleic, linoleic, and stearic acids. CH. ABS. (p)

***Solanum xanthocarpum*, Schard and Wendle. I. Constituents of the oil from the seeds.** M. P. GUPTA and S. DUTT (J. Indian Chem. Soc., 1936, 13, 613—618).—The seeds (20.71% of the fruit) of this plant yield successively to C<sub>6</sub>H<sub>6</sub>, 19.28, CHCl<sub>3</sub> 3.2, EtOAc 1.65, COMe<sub>2</sub> 1.62, and EtOAc 3.39% of oil. The C<sub>6</sub>H<sub>6</sub> extract, a semi-drying oil,  $[\alpha]^{25} -1.35^\circ$  in CHCl<sub>3</sub>,  $d^{27} 0.924$ , f.p. < -11°, acid val. 70.78, Ac val. 40.4, sap. val. 182.5, Hehner val. 94.9, I val. 124.3, contains 1.2% of a mixture of *sterols*, C<sub>25</sub>H<sub>42</sub>O, m.p. 142—143°,  $[\alpha]^{25} +16.24^\circ$  in CHCl<sub>3</sub>, and ? C<sub>24</sub>H<sub>41</sub>O<sub>3</sub>, m.p. 122° after sintering at 92°,  $[\alpha]^{25} ? -83.45^\circ$  in CHCl<sub>3</sub>, and yields, when hydrolysed, oleic (42.9), linoleic (36.2), palmitic (5.4), stearic (9.8), and ? arachidic acid (0.35%). R. S. C.

**Essential oil of *Lantana camara*, L.**—See A., II, 201.

**Odorous principles of lignum aloe.** K. KAFUKU and N. ICHIKAWA (J. Chem. Soc. Japan, 1935, 56, 1155—1163).—Saponification of powdered lignum

aloe from *Aquilaria agallocha*, Roxb., yields benzylacetone and a monoketone,  $C_{14}H_{20}O_2$  (semicarbazone, m.p. 160—162°). The residue contains hydrocinnamic acid, a cryst. acid,  $C_{10}H_{12}O_3$ , m.p. 103°, and a sesquiterpene. CH. ABS. (p)

Sciadopitene from oil of *Sciadopitys verticillata*, S. and Z.—See A., II, 158.

Detection of quinic acid in presence of shikimic acid in the carpels of *Illicium verum*, Hook; quinic acid derivatives.—See A., II, 194.

Chemical and pharmacological examination of *Periploca aphylla*. R. N. CHOPRA, A. T. DUTT, N. R. CHATTERJEE, and N. DE (Arch. Pharm., 1937, 275, 192—195).—The leaves and stems of *P. aphylla* contain a resin alcohol,  $C_{25}H_{41}O_2 \cdot OH$ , +0.5EtOH, m.p. 272.5°, (anhyd.) 275.5° (acetate, m.p. 188.5°), reducing sugars, tannins, and a small amount of glucoside (pharmacological action described), but no strophanthin bases. R. S. C.

[Constituents of] *Pinguicula vulgaris*, L. C. MASINO (Boll. Chim.-Farm., 1937, 76, 92—96).—The plant contains proteolytic (caseinogen) and rennin-like enzymes, Fe 0.29% (calc. on dried material) (1.10% in the roots), Mn nil, and arabinose.

F. O. H.

Occurrence and distribution of saponins in herb drugs. I, II. M. ROBERG (Arch. Pharm., 1937, 275, 84—103, 145—166).—I. Saponins are shown by the blood-gelatin and cholesterol methods to occur in *Chenopodium ambrosioides*, *Convallaria*, *Equisetum*, *Galeopsis*, *Grindelia*, *Herniaria*, *Polygala amara*, *Pulsatilla*, *Virgaurea*, *Viola tricoloris*, and *Stipites dulcamara*, but not in the other 37 herb drugs of the D.A.B. VI and *Ergänzungsband V* and Austrian and Swiss Pharmacopœias. Nine other herbs contain other hæmolytic substances, usually terpenes.

II. Saponins occur in *Anagallis*, *Anthyllis*, *Arenaria arvensis* and *A. rubra*, *Bellis minor*, *Calendula*, *Caltha palustris*, *Eryngium maritimum* and *E. plani*, *Galega*, *Hedera*, *Polemonia coerules* (*Valeriana græca*), *Phytolacca*, *Primula* (*Paralyseos*), *Ranunculus ficaria* (*Chelidonium minor*), *Sanicula* (*Diapensia*), *Saponaria*, *Scrophularia aquatica* and *S. vulgaris seu foetida*, *Solanum nigrum*, *Spinacia*, *Succisa* (*Morsus diaboli*), *Verbascum*, and *Viola odorata*. R. S. C.

Methods of extracting soluble nitrogen from leaves with acid sap. M. C. BILLIMORIA (Proc. Leeds Phil. Soc., 1937, 3, 330—333).—Of the methods described, the one most suitable for small amounts of tissue having an acid sap consists of a pre-treatment with  $Et_2O$  (to inhibit enzymic hydrolysis), and then extraction with cold 70% EtOH containing 10% of  $Et_2O$ . F. A. A.

"Pao de cobra," a drug used in Brazil against the bite of poisonous snakes. K. BODENDORF (Arch. Pharm., 1937, 275, 140—141).—This wood, mixed with  $K_2CO_3$ , yields to EtOH mainly allantoin. R. S. C.

Proteins. VI. Solubility of nitrogenous constituents of seeds in sodium chloride solutions. L. P. O'HARA and F. SAUNDERS (J. Amer. Chem. Soc.,

1937, 59, 352—354).—The amount of nitrogenous material (A) extracted from various fat-free seed meals (orange, peanut, flax) by saturated NaCl is only slightly < that extracted by *N*-NaCl. (A) appears to be almost entirely a cryst. or semi-cryst. protein resembling a globulin (I). The ordinary definitions (lit.) of (I) are thus inaccurate. The amount of (A) extracted from rye flour [which contains little or no (I)] by aq. NaCl is max. with 0.375 and min. with 6*N* (and saturated). H. B.

Preparation of gliadin and zein. L. S. NOLAN and H. B. VICKERY (Proc. Soc. Exp. Biol. Med., 1936, 35, 449—451).—The prep. of gliadin (N content approx. 15.5%) from wheat flour gluten and of zein (N content approx. 16.2%) from maize gluten is described. The products are suitable for nutrition investigations. W. McC.

Water-soluble derivative of edestin and its significance in the theory of protein denaturation. K. BAILEY (Proc. Leeds Phil. Soc., 1937, 3, 334—339).—Small amounts of acid ppt. edestin (I) from a neutral salt solution; alkali re-converts this ppt. (II) into the salt-sol. form (III). (II), freed from inorg. ions, is  $H_2O$ -sol., but rapidly passes into a form which gives the X-ray photograph of denatured (I), and cannot be re-converted into (III). These results are discussed in relation to theories of protein denaturation. F. A. A.

Colloid-chemical characterisation of soya proteins. T. V. RINDIN (Kolloid. Shurn., 1936, 2, 811—819).—7—10% aq. NaCl dissolves up to 40% of the protein present in soya-bean flour. Vals. of  $\eta$  and the surface tension of glycinin hydrosols are recorded. J. J. B.

Physical chemistry of plant proteins. T. V. RINDIN, A. A. MOROSOV, and A. P. SALTSHINKIN (Kolloid. Shurn., 1936, 2, 831—839).—Fractional pptn. by NaCl and  $(NH_4)_2SO_4$  affords four fractions of edestin and two fractions of glycinin possessing different  $\eta$  and osmotic pressures. J. J. B.

Chlorophyll content of foliage of dicaceous plants. N. T. DELEANO and J. DICK (Biochem. Z., 1937, 289, 320—322; cf. A., 1935, 1177).—The fully developed leaves of a willow (*Salix fragilis*) with male blossoms contained approx. 33% more chlorophyll (I) than did those of a willow with female blossoms. The corresponding excess of (I) in the leaves of a white poplar (*Populus alba*) with male blossoms was approx. 25%. W. McC.

Colouring matters of Grimes Golden, Jonathan, and Stayman Winesap apples.—See A., II, 206.

Eloxanthin, a carotenoid pigment from *Elodea canadensis*.—See A., II, 204.

Alkaloids from hanfangchi.—See A., II, 219.

Determination of *Chelidonium* alkaloids. I. G. SCHENCK and H. GRAF (Arch. Pharm., 1937, 275, 113—125).—The total alkaloids of *C. majus* are determined by extracting an intimate mixture of the root (2 g.), sand (100 g.), and 30% NaOH (3 g.) with  $CHCl_3$  in a Soxhlet apparatus; the extract is conc. and extracted with 10 c.c. of 0.1*N*- $H_2SO_4$ , and the acid solu-

tion is heated, filtered, and titrated (Me-red) with 0.1N-NaOH. A sample of root thus showed 1.6% of alkaloïds. Acid extraction gives erratic results. Gallais'  $K_2HgI_4$  method is difficult, but gives good results.

R. S. C.

**Constituents of bark of *Lunasia costulata* (Miq.).**—Sec A., II, 216.

**Developments in the quantitative spectrographic analysis of solutions.** O. S. DUFFENDACK and K. B. THOMSON (Proc. Amer. Soc. Test Mat., 1936, II, 36, 301—309).—The various spectrographic methods proposed for determining Na, K, Ca, and Mg in urine, blood, saliva, etc. are reviewed.

R. B. C.

**Quinhydrone electrode for tissues.** J. C. KRANTZ, jun., C. J. CARR, and R. MUSSER (Science, 1937, 85, 127—128).

L. S. T.

**Capillary, non-penetrating micro-quinhydrone electrode.** J. A. PIERCE (J. Biol. Chem., 1937, 117, 651—654).—An apparatus, which can be readily sterilised, has been developed for determination of the  $p_H$  of <1.0 cu. mm. of biological fluids. Vals. are given for various cerebrospinal fluids at 38°.

P. G. M.

**Vital staining of the reticulo-endothelial system.** M. GREYER (Boll. Soc. ital. Biol. sperim., 1936, 11, 788—791).—Factors concerned with vital staining methods are discussed and a suitable general technique is suggested.

F. O. H.

**Photometric determination of bilirubin.** L. JENDRASSIK and R. A. CLEGHORN (Biochem. Z., 1937, 289, 438; cf. this vol., 108).—In the equation for calculating the bilirubin concn. the correct val. for  $s$  is 0.03 when 0.5 c.c. of diazo-solution is used. Interference due to colour developed in the caffeine-NaOBz mixtures is avoided by comparing with such mixtures containing no diazo-solution.

W. McC.

**Colour reaction for phloridzin.** A. LAMBRECHTS (Compt. rend. Soc. Biol., 1937, 124, 263—264).—The method depends on the formation of a red colour with 1 : 2-NO- $C_{10}H_6$ -OH. Vals. thus obtained agree with those by the spectrographic method for the disappearance of phloridzin from plasma.

H. G. R.

**Determination of alanine in biological materials.** E. W. MCCHESENEY (J. Elisha Mitchell Sci. Soc., 1935, 51, 147—150).—Conversion of alanine into MeCHO in Kendall and Friedemann's method (cf. A., 1931, 246) reaches an equilibrium at approx. 91% completion and a correction must be made. Other  $NH_2$ -acids (e.g. valine, leucine) also interfere with the determination.

CH. ABS. (p)

**Voisenet's tryptophan reaction.** S. RAPOPORT and W. EICHENKRE (Biochem. Z., 1937, 289, 288—289).—Errors of the method are investigated particularly in its application to the determination of tryptophan in caseinogen and milk.

P. W. C.

**Turbidity in determination of uric acid with the photo-electric colorimeter.** I. M. DILLER (J. Biol. Chem., 1937, 118, 161—162; cf. A., 1936, 1223; Benedict and Behre, A., 1931, 973).—The concn. of HCl in the standard (and in the diluted standard if used) must be <1 part (d 1.19) in 200. When dilution is necessary, it must be carried out before

the colour reagents are added. The time required for the uric acid colour to develop must be carefully controlled.

W. McC.

**Micro-determination of liver- and muscle-glycogen in tissues.** A. LOUBATIERES (Compt. rend. Soc. Biol., 1937, 124, 699—700).—A method is described using 0.5 g. of tissue, the sugar resulting from hydrolysis being determined by the Hagedorn-Jensen method.

H. G. R.

**Micro-determination of urea in physiological fluids.** V. RANGANATHAN and B. N. SASTRI (Proc. Soc. Biol. Chem. India, 1937, 1, 5).—The change in conductivity accompanying the enzymic hydrolysis of urea is utilised as a basis for the micro-determination of urea in small quantities of physiological fluids.

**Method for determining carbon dioxide applicable to blood and tissues.** G. V. ANREP, M. S. AYADI, and M. TALAAT (J. Physiol., 1936, 86, 153—161).—The blood or tissue is hydrolysed with 5%  $CO_3^{--}$ -free NaOH under paraffin for 30 min. at 60—65°. The  $CO_2$  is liberated from the cooled hydrolysate with 0.4N- $H_2SO_4$  containing 1% of  $CuSO_4$  to remove  $H_2S$ , and determined manometrically. The hydrolysed material may be stored for a day in the cold without undergoing any appreciable change in  $CO_2$  content.

R. N. C.

**Device for indicating continuously the approximate percentage of carbon dioxide in a stream of flowing gases.** W. B. DRAPER and B. B. LONGWELL (Colorado Med., 1935, 32, No. 11, 899—900).—Anæsthetic gases are bubbled through aq. bromocresol-purple or Me-red and the  $CO_2$  content is determined by the colour change.

CH. ABS. (p)

**Micro-determination of water in biological fluids.** H. MITANI (Keijo J. Med., 1936, 7, 301—318).—The procedure applicable to 50—100 mg. is described (cf. Kuroda, A., 1933, 1094).

A. L.

**Micro-determination of water in biological fluids.** K. KURODA (Keijo J. Med., 1936, 7, 319—326).—The method is described (cf. preceding abstract).

A. L.

**Dinitroresorcinol, a specific stain for iron in tissues.** A. A. HUMPHREY (Arch. Path., 1935, 20, 256—258).—Of customary stains examined only dinitroresorcinol gave a satisfactory (and permanent) result for tissues fixed in  $CH_3O$  and mounted in paraffin.

CH. ABS. (p)

**Determination of iron in soil extracts and other biological media.** B. A. S. IYENGAR (Proc. Soc. Biol. Chem. India, 1937, 1, 11).—The Fe is titrated with  $Ce(SO_4)_3$ , diphenylaminesulphonic acid being used as internal indicator.

W. O. K.

**Determination of blood-potassium.** R. TRUSZKOWSKI and R. L. ZWEMER (Biochem. J., 1937, 31, 229—233).—The authors' method (A., 1936, 1145) is modified in order to make it applicable over a wider temp. range. 0.01—0.1 mg. of K and the K in 0.1—0.2 ml. of plasma may now be determined.

P. W. C.

**Micro-determination of strontium and calcium in mixtures containing both.**—See A., I, 262.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

JUNE, 1937.

**Chemotactic reaction of leucocytes to foreign substances in tissue culture.** R. CHAMBERS and C. G. GRAND (*J. Cell. Comp. Physiol.*, 1936, 8, 1—19).—A strongly positive chemotactic effect was shown by sucrose, maltose, lactose, fructose, glucose, glycogen, starch, agar, gum arabic, and cellulose (I), a negative effect by Na and K palmitate and oleic acid, no effect by NaCl,  $\text{CaCl}_2$ , Tyrode solution, Ringer's solution, olive oil, stearic acid, Mg and Ca palmitate, C, quartz, washed  $\text{MnO}_2$ , silk, or sandarac gum. In the absence of serum, starch and (I) were neutral. M. A. B.

**Tension at the surface of macrophages.** H. SHAPIRO and E. N. HARVEY (*J. Cell. Comp. Physiol.*, 1936, 8, 21—30).—Determination of the centrifugal force necessary to pull oil globules through the surface shows the max.  $\gamma$  of about 2 dynes per cm. at 23—28° for rabbit leucocytes in Ringer-Locke solution or dil. serum. For frog leucocytes the val. was about 1.3 dynes per cm. M. A. B.

**Action of some carcinogenic substances on blood-leucocytes.** E. TASCHNER, M. SPRITZER, G. GOTTLIEB, and D. LAZAR (*Compt. rend. Soc. Biol.*, 1937, 124, 957—960).—A decrease in the leucocyte count is observed in mice. H. G. R.

**Oxidative resynthesis of adenosine triphosphate in leucocytes.** M. N. LIUBIMOVA (*Biochimia*, 1937, 2, 367—382).—In rabbit leucocytes adenosine triphosphate (I) is resynthesised during respiration. There is no relation between glycolysis and resynthesis of (I). Respiration of the leucocytes is depressed by  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  and is not restored by addition of lactate. 0.01*N*-KCN restricts glycolysis, but does not completely stop respiration. In cells stained with neutral-red the decrease in the (I) content when "paranecrosis" begins and the increase when normal conditions are restored are observed. W. McC.

**Permeability, sugar distribution, and glycolysis in erythrocytes.** A. I. KOLOTOLOVA and V. A. ENGELHARDT (*Biochimia*, 1937, 2, 387—401).—The sugar content of erythrocytes represents the resultant of the rate of penetration of sugar and the rate of glycolysis within the cells. Erythrocytes of the pig are totally impermeable to sugar, human erythrocytes are perfectly permeable, and those of other species are intermediate. In man the rate of penetration is  $\gg$  the rate of glycolysis. Hence glycolysis has little effect on the sugar content. When glycolysis is inhibited by F,  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ , or otherwise the distribution of sugar between erythrocytes and the surrounding medium eventually attains equilibrium.

Penetration of non-fermentable sugars is similar but is not affected by F'. W. McC.

**Changes in the adenosine triphosphate content of pigeon erythrocytes.** A. A. BAEV (*Biochimia*, 1937, 2, 454—478).—Anaerobic dephosphorylation and deamination of adenosine triphosphate (I) in the erythrocytes occur because of the absence of  $\text{PO}_4'''$  donator and acceptor. Part of the  $\text{NH}_3$  and  $\text{PO}_4'''$  liberated is not derived from (I). The erythrocytes contain small variable amounts of adenylic acid which is rapidly deaminated under anaerobic, but not under aerobic, conditions. The products of anaerobic breakdown of (I) do not undergo subsequent re-amination under aerobic conditions. Partial aerobic breakdown of (I), not accompanied by glycolysis, is caused by addition of F' or  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  and to a smaller extent by deprivation of glucose. W. McC.

**Mechanism of the liberation of the nucleus and behaviour of a suspension of isolated nuclei.** N. YAKUSIZI (*Keijo J. Med.*, 1936, 7, 521—582).—The liberation of the nuclei of leucocytes and nucleated erythrocytes by hæmolytic agents (*e.g.*, saponin, digitonin) under varying conditions of inorg. salt concn. etc. and the properties of the resulting suspensions of nuclei were investigated. W. O. K.

**Individual differences in the degree of hæmolysis and the factors which determine them.** Y. EGAMI (*Keijo J. Med.*, 1936, 7, 596—611).—Ease and difficulty of hæmolysis by hypo- and hyper-tonic solutions, respectively, and high vals. for depression of f.p. by the corresponding serum are (as are also the collated converse properties) associated phenomena in blood corpuscles (ox). W. O. K.

**Resynthesis of adenosinetriphosphoric acid in the oxidation of  $\alpha$ -keto- and -amino-acids in nucleated erythrocytes.** V. A. SEVERIN (*Biochimia*, 1937, 2, 60—69).—The  $\text{O}_2$  intake of washed pigeon erythrocytes is raised by alanine, glutamic acid,  $\alpha$ -keto-butyric and -glutaric acid, but not by glycine, valine, leucine, phenylalanine, or  $\text{CH}_2\text{Ph}\cdot\text{CO}\cdot\text{CO}_2\text{H}$ . At the same time, resynthesis of adenosinetriphosphoric acid is intensified. R. T.

**The erythrocyte and its relation to blood pressure.** H. MCG. DOLES (*Virginia Med. Monthly*, 1935, 62, 489—496).—Enlargement of erythrocytes in hypertension is probably due to increased Fe possibly associated with kidney damage. During treatment of nephritis there is increase in erythrocyte count associated with decrease in cell size and in

hæmoglobin and Fe content. Plasma- and urinary Fe should be determined in hypertension.

CH. ABS. (p)

Individual differences in the permeability of the erythrocytes of rabbits. Effect of bleeding. S. L. ØRSKOV (Biochem. Z., 1937, 290, 235—240; cf. A., 1935, 1260).—The rate at which erythrocytes (rabbit) are permeated by glycerol (I) is subject to great individual variations not observed when thio-urea (II) replaces (I). With (I), but not with (II), the rate is very greatly increased by bleeding, the val. returning to normal 50—120 days after the normal hæmoglobin level is restored. Possibly the increased rate is due to the more rapid permeation of newly produced erythrocytes. The rate of permeability by (I) of erythrocytes from dogs is not increased by bleeding.

W. McC.

Hæmoglobin function during the life history of the bullfrog. F. H. MCCUTCHEON (J. Cell. Comp. Physiol., 1936, 8, 63—81).—The  $O_2$  dissociation curve of the hæmoglobin (I) changes from a rectangular hyperbola in the tadpole to a sigmoid curve in the adult and at the same time shifts towards the right. In tadpoles "loading capacity" increased with decrease in  $p_H$  below the normal physiological range. In adult tadpoles at  $p_H$  6.80 "loading capacity" decreased and "unloading capacity" increased; at  $p_H$  6.47 both increased.  $O_2$  capacity was higher in adult than in tadpole blood and was max. in frogs of intermediate size. At the max.  $O_2$  capacity the  $O_2$  dissociation curve of the tadpole was farthest to the right.

M. A. B.

Action of an electric current on hæmoglobin in presence of electrolytes. R. DUVAL (Compt. rend., 1937, 204, 728—730).—The behaviour of hæmoglobin in  $H_2O$  or aq. 10% KCl, KI,  $K_2SO_4$ , or  $NH_4OAc$  in a U-tube cataphoresis apparatus is described.

F. O. H.

Denaturation of hæmoglobin. H. F. HOLDEN (Austral. J. Exp. Biol., 1937, 15, 43—48).—Hæmoglobin can be denatured in an atm. of  $H_2$  by 0.1N-HCl, EtOH, and *o*-OH- $C_6H_4$ - $CO_2Na$ . Renaturation (60—95%) is effected by 0.1N-NaOH in the first case and by  $H_2O$  in the other cases.

J. N. A.

Reaction of nitric oxide with hæmoglobin and methæmoglobin. D. KEILIN and E. F. HARTREE (Nature, 1937, 139, 548).—When mixed with NO, solutions of oxyhæmoglobin reduced to hæmoglobin (I) by evacuation become red and show wide, diffuse bands at 574.5 and 536 m $\mu$ . The same result is obtained in presence of an excess of  $Na_2S_2O_4$  added at different stages of the reaction. The compound NO-(I) is very stable and is only slowly oxidised by  $K_3Fe(CN)_6$  to methæmoglobin (II). An acid solution of (II) turns red with NO and its absorption spectrum is replaced by bands at 568 and 531 m $\mu$ . The compound NO-(II) is obtained in presence of a large excess of  $K_3Fe(CN)_6$ .  $SO_3^{--}$  on combining with the NO liberates acid (II). KCN can replace NO in the compound, which is thus much less stable than NO-(I).

L. S. T.

New blood-pigment: pseudo-methæmoglobin. N. H. FAIRLEY (Nature, 1937, 139, 588).—

The plasma of severe cases of blackwater fever contains a new pigment,  $\psi$ -methæmoglobin (I), which has hitherto been mistaken for methæmoglobin (II), and from which it can be distinguished chemically and spectrographically. It is readily produced *in vitro* from plasma and hæmoglobin by incubation for 48 hr. at 37—40°. It is also formed from (II), prepared by treating laked corpuscles with  $K_3Fe(CN)_6$ , and plasma by a similar method. The results indicate that in any severe intravascular hæmolysis it is (I) and not (II) which is formed.

L. S. T.

Cytochrome-C. II. Synthesis from protoporphyrin. H. KATAGIRI, K. MASUDA, and T. HEMEMOTO (J. Agric. Chem. Soc. Japan, 1937, 13, 206—207; cf. this vol., 119).—Pyridine-hæmochromogen of the porphyrin-C obtained from blood hæmin has absorption bands at 550 and 521 m $\mu$ , whilst the corresponding nicotine compound has bands at 551 and 523 m $\mu$ . These hæmochromogens resemble cytochrome-C in their behaviour towards air and reducing agents.

J. N. A.

Stability of colloid osmotic pressure and of serum-protein. K. YANAGI (J. Clin. Invest., 1935, 14, 853—862).—In sera of normal protein content the pressure once developed (osmometer) remained const. for 16—18 hr. With low-protein sera, the pressure increased to a max. in 3—5 hr. and subsequently declined. Similar instability resulted from diluted (saline) normal sera. Concn. of hypoproteinaemic sera by ultrafiltration produced stable pressures.

CH. ABS. (p)

Protein-sugar, protein content, and carbohydrate index of sera and body-fluids of different animals. B. LUSTIG and T. ERNST (Naturwiss., 1937, 25, 89, and Biochem. Z., 1937, 289, 365—389).—Vals. are given for the relative amounts of carbohydrate associated with serum- and body-fluid-proteins in different organisms. They diminish as the protein content increases and with ascent of the evolutionary scale from coelenterata to mammalia. The index is the no. of g. of protein-N per g. of protein-sugar.

F. A. A.

Opossum (*Trichosurus vulpecula*). I. Blood analyses and lipin glandular constituents in normal and lactating opossums. II. Effects of splenectomy, adrenalectomy, and injections of cortical hormone. D. ANDERSON (Austral. J. Exp. Biol., 1937, 15, 17—23, 24—32).—I. Sugar (I), total P, non-protein-N (II), and lipins (III) in opossum blood, and (III) in glands are determined. Cells contain 60% as much (I), and > twice as much (II), as plasma; vals. increase with age. The liver has less cholesterol (IV) than other organs and the adrenals contain more (III), (IV), and fatty acids than other glands. During lactation the dry wt. of the adrenals increases, (II) and (III) are unchanged, but there is marked hyperglycemia.

II. Splenectomy decreases blood-(III) and -(IV), and increases -(II) and -lipin-P. Adrenalectomy increases liver-(IV). Administration of cortical hormone decreases liver-(IV) and increases lipin-P and fatty acids in liver and spleen, increases (I) and (II) in blood, and alters the distribution of (II) between cells and plasma.

J. N. A.

**Blood composition in summer and winter of *Helix pomatia*.** B. LUSTIG, T. ERNST, and E. REUSS (Biochem. J., 1937, 290, 95—98).—In summer the blood of the snail *H. pomatia* contains 2.4% of protein (97.7% globulin), no cholesterol, the residual N and free sugar contents are small, the protein-sugar is high, electrolytes consist chiefly of Na and Cl, the K and Mg vals. are the same, and the Ca val. > and  $P_2O_5$  val. < in mammals. In winter sleep the K is unchanged, the Na, Cl, Ca, albumin, residual N, Mg, and inorg. P are increased by 15.3, 40.7, 57.86, 68.3, 104, 158, and 12.2%, respectively. The large increase in Mg is probably the cause of winter sleep.

P. W. C.

**Normal level of phosphorus-containing blood constituents in amphibians and reptiles.** R. SALGUES (Compt. rend., 1937, 204, 524—525).—Analyses of the total P and various P fractions in the blood of some amphibians and reptiles are recorded.

W. O. K.

**Histamine in cotton dust and in the blood of cotton workers.** E. HAWORTH and A. D. MACDONALD (J. Hyg., 1937, 37, 234—242).—Histamine (as picrate and hydrochloride) has been isolated from cotton dust. The histamine content of the blood of card-room workers was > that of students and of elderly chronic bronchitis patients.

W. L. D.

**Presence of histamine in normal human blood.** G. UNGAR, J. L. PARROT, and A. POCOULÉ (Compt. rend. Soc. Biol., 1937, 124, 1202—1203).—The blood contains approx.  $30 \times 10^{-6}$  g. per litre, representing only a small proportion of the glyoxalines.

H. G. R.

**Determination of carotene in small amounts of blood.** W. HALDEN and G. K. UNGER (Mikrochem., Molisch Festschr., 1936, 194—200).—The serum from 1—1.5 c.c. of blood is coagulated with an equal vol. of EtOH. The liquid is extracted with two vols. of light petroleum, and carotene in the extract is determined photometrically by filtered light. The petroleum solution is stable.

J. S. A.

**Determination of cholesterol.** W. M. SPERRY (J. Biol. Chem., 1937, 118, 377—389).—The micro-method of Schoenheimer and Sperry (A., 1934, 1240) with minor variations in procedure gives vals. for free cholesterol in blood-serum not differing significantly from those obtained by the Windaus macro-method.

R. M. M. O.

**Action of carbon monoxide on oxysterol in blood.** I. T. H. TANG and Y. H. CHAO (J. Chinese Chem. Soc., 1937, 5, 6—7).—Chemical and spectroscopic examination of the dried residues from the EtOH-ligroin extracts of normal ox-blood and blood poisoned by CO shows that the oxysterol of normal blood is different from the cholesterol product in CO-poisoned blood.

J. W. B.

**Blood-sugar and sugar storage in the de-pancreatised dog.** A. BAISSSET, L. BUGNARD, J. LANSAC, and L. SOULA (Sang, 1936, No. 5, 537—561).—I. Excess of glucose (I) introduced into the circulation is removed from the blood whether it contains insulin (II) or not. The only difference

between the normal and depancreatised dog is that the initial level in the latter is three times that in the former.

II. In the depancreatised dog, following intra-venous injection of (I), arterial blood-sugar is first >, then equal to, and finally < that of venous blood. The sugar always returns to the habitual level.

III. Injection of (II) into a depancreatised dog does not significantly affect the reaction to intra-venously injected (I). The final blood-sugar level is always equal to, or slightly <, the original. (II) affects only this level.

NUTR. ABS. (m)

**Effect of experimental peripancreatic sympathectomy on the basal blood-sugar.** M. SENDRAIL and M. CAHUZAO (Compt. rend. Soc. Biol., 1937, 124, 1088—1090).—In the post-operative period, hyper- then hypo-glycæmia were observed; this was followed by prolonged hyperglycæmia, with a max. after about 20 days, after which prolonged hypoglycæmia lasting several months occurred.

H. G. R.

**Effect of castration and low external temperature on blood-sugar in cockerels.** F. KUBESSA (Arch. wiss. pr. Tierheilk., 1936, 71, 76—82).—In cockerels 4—5 months old, castration produced a decrease averaging 34% in the sugar content of the blood, the effect persisting for < 3 weeks. The body temp. was scarcely affected. The increase in blood-sugar produced by exposure to a temp. of  $-1^{\circ}$  to  $-4^{\circ}$  for 4 hr. averaged 4% in non-castrated and 8% in castrated cockerels.

NUTR. ABS. (m)

**Hyperglycæmia caused by bleeding.** F. KINDL (Arch. wiss. pr. Tierheilk., 1936, 71, 83—88).—Hyperglycæmia in dogs is detectable after 25%, and distinct after 33%, of the total blood is withdrawn. The extra sugar is probably transferred from the glycogen depôts to the blood. The  $H_2O$  content also increases.

NUTR. ABS. (m)

**Effect of acetylcholine on the blood-sugar of the adrenalectomised dog.** F. JOURDAN and J. VIAL (Compt. rend. Soc. Biol., 1937, 124, 1111—1112).—The blood-sugar fluctuates on either side of the initial val.

H. G. R.

**Effect of inorganic salts on blood-sugar of rabbits.** T. OGAWA (Mitt. med. Akad. Kioto, 1936, 18, 177—204).—In rabbits the blood-sugar was increased by the injection of Mg salts and of  $PO_4'''$ ; Na and K salts had little effect. The amount of combined sugar in the blood did not change appreciably on injection of any one of these salts.  $MgCl_2$  was more toxic than  $MgSO_4$ .

NUTR. ABS. (m)

**Comparative determinations of urea in the blood and in the pericardiac fluid of *Rhombus macoticus* and *Trygon pastinaca*.** P. JITABU (Ann. Sci. Univ. Jassy, 1935, 20, 477—479).—The urea concn. (determined by NaOBr) is the same in blood and in pericardiac fluid. Vals. were, *T. pastinaca* 2.05 g. and *R. macoticus* 0.025 g. per 100 c.c.

J. W. B.

**Variations in blood-urea and -chloride during obstruction of the small intestine in the dog.** O. GILSON (Compt. rend. Soc. Biol., 1937, 124, 1254—

1256).—Urea is increased after the operation and Cl<sup>-</sup> decreases shortly before the death of the animal.

H. G. R.

**Ammonia formation in shed blood and a characteristic deaminase of the blood stream.** E. J. CONWAY and R. COOKE (*Nature*, 1937, **139**, 627).—In the shed blood of man, rabbit, and bird, the formation of NH<sub>3</sub> occurs in a succession of well-marked stages. In rabbit's blood, the optimum is 8.7 and NH<sub>3</sub> formation ceases at a concn. of 5% NaCl. The plasma and red corpuscles of the blood of man, fowl, frog, and lug worm contain a powerful enzyme which liberates NH<sub>3</sub> from adenosine at room temp. The nucleated corpuscle of the fowl can deaminate adenine, guanine, and cytosine readily at room temp.

L. S. T.

**Determination of chloride in blood.** K. LANG (*Biochem. Z.*, 1937, **290**, 289—290).—The accuracy of Votoček's method (A., 1918, ii, 272) is increased by using diphenylcarbazone (I) or a substituted (I) as indicator in place of Na nitroprusside. W. McC.

**Chloride and total osmotic pressure in the blood of marine teleosts.** A. L. GRAFFLIN (*Biol. Bull.*, 1935, **69**, 245—258).—In fish examined there was no correlation between plasma-Cl and the f.p. depression of whole blood. CH. ABS. (p)

**Determination of serum-calcium.** C. W. EDMUNDS (*J. Amer. Pharm. Assoc.*, 1937, **26**, 259).—Ca is pptd. from the serum (2 c.c.) by (NH<sub>4</sub>)<sub>2</sub>C<sub>2</sub>O<sub>4</sub> and the ppt. is washed with dil. aq. NH<sub>3</sub>, dissolved in N-H<sub>2</sub>SO<sub>4</sub>, and titrated with 0.01N-KMnO<sub>4</sub>, the determination being performed in a 15-c.c. centrifuge tube.

F. O. H.

**Determination of serum-calcium by titration with ceric sulphate.** E. KATZMAN and M. JACOBI (*J. Biol. Chem.*, 1937, **118**, 539—544).—0.2 mg. of Ca as CaC<sub>2</sub>O<sub>4</sub> can be determined by titration with standard Ce(SO<sub>4</sub>)<sub>2</sub>, with ICl as catalyst and *o*-phenanthroline as indicator. The % deviation of a single determination from the mean is 0.4. J. N. A.

**Content of water in the blood of 1069 normal adult men.** K. KURODA, T. RYÔ, and R. EBINA (*Keijo J. Med.*, 1936, **7**, 612—643).—A statistical study of observations on Japanese soldiers.

W. O. K.

**Hibernation.** O. POLIMANTI (*Protoplasma*, 1936, **25**, 461—464).—In *Bufo* and *Rana* the average  $p_H$  of the blood, organs, and tissues was 7.45 during activity, 7.6 during dormancy, and 7.9 during awakening. M. A. B.

**Coefficient of retention of Congo-red in rabbit's plasma (method of Adler and Reimann).** P. CARNOT, R. CACHERA, and T. MELIK-OGANDJANOFF (*Compt. rend. Soc. Biol.*, 1937, **124**, 938—941).—The mean coeff. of retention is 56.2%. H. G. R.

**Convenient tonometer for the equilibration of blood.** L. IRVING and E. C. BLACK (*J. Biol. Chem.*, 1937, **118**, 337—340).—The instrument is described. By equilibrating at a temp. above that of filling the tonometer an excess of pressure is developed which is used for forcing the liquid into the pipette.

R. M. M. O.

**Microcrystallographic identification of blood spots *in situ*.** A. RAITZIN (*Rev. asoc. med. argentina*, 1935, **49**, 1115—1122).—The method employs the Leitz ultrapak and the formation of cryst. hæmin hydrochloride. CH. ABS. (e)

**Effect of light on the decomposition and the detection of blood in connexion with forensic examinations.** K. J. HOMMES (*Pharm. Weekblad*, 1937, **74**, 396—420).—Blood stains were exposed to direct and diffuse sunlight on various substrates, and submitted to detection tests. The guaiacol test failed on Zn and Sn after a short exposure to direct sunlight and on silk after a moderate exposure. Fe and Cu gave a positive test in the absence of blood. The hæmochromogen and hæmin crystal tests became indefinite on silk and cotton after a short exposure to direct sunlight and on filter-paper after a longer exposure. Similar results were obtained in diffuse light, and in the dark with exposures of >1 year. Excellent crystals were obtained on wool. Blood soon loses its solubility in H<sub>2</sub>O on Zn, Cu, Ag, painted wood, and silk. The substrate has a marked effect on the changes occurring in blood stains on ageing; thus stains on wool are affected < those on other fabrics. Blood is quickly converted into methæmoglobin and more slowly into hæmochromogen and finally hæmatin. Human blood and pigs' blood are similar, both being decomposed most rapidly by light of  $\lambda$  480—545 m $\mu$  and least by infra-red light (>580 m $\mu$ ). Stains are best photographed by infra-red rays and a study has been made of the absorption spectrum of oxyhæmoglobin over the range 635—1335 m $\mu$ . S. C.

**Gelation of whole blood.** W. KOPACZEWSKI and R. PAILLE (*Compt. rend.*, 1937, **204**, 726—728).—Whole blood (horse; in vessels coated with paraffin wax) slowly gels at 37° in presence of <60% (>48 hr.) or 0.125—2.0% (5—180 min.) of lactic acid; intermediate concns. cause immediate gel formation.

F. O. H.

**Blood coagulation.** V. Coagulation by proteolytic enzymes. H. EAGLE and T. N. HARRIS (*J. Gen. Physiol.*, 1937, **20**, 543—560).—Both crude and cryst. trypsin (I) may cause the coagulation of the blood or plasma of men, dogs, rabbits, guinea-pigs, and horses. Coagulation occurs only within a narrow optimum zone of (I) concn. (I) does not coagulate fibrinogen (II), but reacts with plasma pro-thrombin (III) to form thrombin (IV). It is suggested that the system Ca + platelets contains a proteolytic enzyme with a sp. affinity for (III). Papain also coagulates blood, not by activation of (III) but by direct action on (II) to form a fibrillar gel resembling fibrin. If this clot is fibrin, (IV) may also be a proteolytic enzyme with a sp. action on (II). E. A. H. R.

**Fibrinolysis.** VI. Relation of thrombolysin and thromboligin to blood coagulation. M. ROSENMAN (*Biochem. Z.*, 1937, **290**, 213—224; cf. A., 1936, 1556).—Thromboligin (I) slightly stimulates the coagulation but the effect is not  $\propto$  the (I) concn. Heparin is less effective as an inhibitor of fibrinolysis than is (I). Thrombolysin (II) inhibits coagulation even in presence of added thrombin or thrombokinase, the effect running parallel to the

fibrinolytic effect and increasing with increase in time of action. Other factors involved in coagulation have no appreciable effect on fibrinolysis; they cannot be replaced by (I) or (II). W. McC.

**Synthetic immunochemistry.**—See A., II, 268.

**Production of antibodies *in vitro*.** R. C. PARKER (Science, 1937, 85, 292—294).—Positive results were obtained with rabbit spleens when the antigen was allowed to remain in the animal for < two or three days, and negative when this period was shortened. L. S. T.

**Formation of normal antibodies. Different grades of isoagglutinins with uniovular triplets.** F. OTTENSOOSER and W. TOBLER (Z. Immunitäts., 1937, 90, 65—70).—Differences in isoagglutinin titre occur in young uniovular triplets. C. R. S.

**Action of heat on the anti-complementary power of human serum.** L. NATTAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt. rend. Soc. Biol., 1937, 124, 1144—1146).—Human serum, like rabbit- and dog-serum, with a low anti-complementary power shows an increase on heating to 56—62°. H. G. R.

**Stabiliser for Schick [diphtheria] toxin.** A. T. GLENNY and M. F. STEVENS (Brit. Med. J., 1937, 709—710).—Human serum is a suitable stabiliser to replace the customary peptone, which causes allergic reactions. A. G. P.

**Antitoxin stabilised by formaldehyde and isolated from antidiphtheria serum by sodium  $\beta$ -naphthylamine-4 : 6 : 8-trisulphonate.** H. GOLDIE (Compt. rend. Soc. Biol., 1937, 124, 1215—1218).—80% of the antitoxic power can be recovered by this process, the active fraction being free from serum-albumin and stable to heat at 70°. H. G. R.

**Toxins of dysenteric bacteria. Toxic principles of the bacillus of Flexner.** A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 1078—1081).—The *R* and *S* forms of Flexner's bacillus produce neither endotoxin nor exotoxin, whilst the *S* form produces only enterotropic endotoxin; the corresponding forms of Shiga's bacillus produce neurotropic exotoxin (I) and (I) and enterotropic endotoxin, respectively. H. G. R.

**Protective antitoxic power of the sera obtained from animals injected with sugar-lipin endotoxins.** A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 1092—1094).—The specificity of the anti-endotoxin serum is similar to that shown in the somatic agglutination of the bacteria and in the pptn. of the sugar-lipin endotoxin. H. G. R.

**Method for rapid and intensive production of tetanus antitoxin.** G. RAMON, E. LEMÉTAYER, and A. MUSTAFA (Compt. rend. Soc. Biol., 1937, 124, 895—898). H. G. R.

**Tetanus toxoid. III. Antitoxic response in guinea-pigs immunised with tetanus alum-precipitated toxoid followed by tetanus spores.** F. G. JONES and W. A. JAMIESON (J. Bact., 1936, 32, 33—40).—Injection of the toxoid gives protection (within 2 months) against massive doses of tetanus

spores. These doses do not accelerate antitoxin production in animals previously immunised with the toxoid. A. G. P.

**Identification of the hæmagglutinin of the jack bean with concanavalin-A.** J. B. SUMNER and S. F. HOWELL (J. Bact., 1936, 32, 227—237).—The prep. and properties of concanavalin-A (I) are discussed and its identity with the hæmagglutinin is established. The ppt. formed by (I) with glycogen (II) contains 44—79% of (I) according to the relative proportions present. Agglutination is regarded as a reaction between (I) and the stromata (possibly glyco-protein constituents) of erythrocytes to produce a hydrophobic colloid. The charge on the colloid is neutralised by salts, resulting in the clumping of the formed elements (cf. A., 1936, 768). A. G. P.

**Extraction of holosido-haptens of the tubercle bacillus and their chemical properties.** C. IONESCU-MIHAIESTI, A. DAMBOVICEANU, and C. LEONIDA-IOAN (Compt. rend. Soc. Biol., 1937, 124, 973—976).—The  $\text{CCl}_3\text{-CO}_2\text{H}$  extract of the culture medium after prolonged dialysis is rich in, whilst that of the bacilli contains little, polyholosides. H. G. R.

**Specificity of the acid-soluble holosido-haptens of the tubercle bacillus.** C. IONESCU-MIHAIESTI, C. LEONIDA-IOAN, and A. DAMBOVICEANU (Compt. rend. Soc. Biol., 1937, 124, 976—978).—The haptens prepared by  $\text{CCl}_3\text{-CO}_2\text{H}$  extraction show no complete antigenic power *in vivo*, but the reactions on subcutaneous administration to tubercular subjects are sp. for the type of organism used. H. G. R.

**Photometric and chemical investigation of blood groups.** J. GRÓH, L. SZÉLYES, and M. WELTNER [with P. BALINT, G. CSERMAK, J. KOVÁCS, and J. SIMON] (Biochem. Z., 1937, 290, 24—38).—Well-defined differences exist between the absorption spectra of serum-globulins (I) of blood groups *A* and *B*, the absorption max. increasing considerably in alkaline solution with (I)-*A* but not with (I)-*B*. The (I)-fractions of blood group *O* differ with sex. With immunised sheep the (I) of anti-*A*-immune sera belong to type *A* (increased absorption in alkaline solution), those of anti-*B*-sera to type *B*. No difference in  $\text{NH}_2$ -acid content could be detected in the (I) and albumins of different blood groups and the spectroscopic difference is probably due to isomerism in the protein. P. W. C.

**Mineral composition of muscles of marine animals.** K. BIALASZCOWICZ and C. KUPFER (Acta Biol. exp., 1935, 9, 223—235).—There is no significant difference between the K, Na, Mg, and Ca contents of the ash of muscles of certain marine and fresh- $\text{H}_2\text{O}$  animals. NUTR. ABS. (m)

**Zinc content of muscles of various animals.** P. V. SIMAKOV (Biochimia, 1936, 1, 685—691).—The Zn content, in mg. per 100 g. of dry substance, is: earthworm 28.46, mollusc foot 26.5, mantle 105.2, frog 8.6, fish 3.3—4.2, chicken (red) 14.1, (white) 2.9, human pectoral muscle 11.9. R. T.

**Biochemistry of the placenta.** Y. FURUHASHI (Japan. J. Med. Sci., 1937, II, 3, 227—237).—Data for the content of  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{++}$ ,  $\text{Ca}^{++}$ ,  $\text{Cl}^-$ , S, and P

at various stages of development of the placenta (rabbit) are tabulated. Retention of blood-Ca, but not of -Cl', occurs.

F. O. H.

**Distribution of calcium and magnesium in organs and tissues after administration of bile acids.** M. IWADÔ (Arb. med. Fak. Okayama, 1936, 5, 85—90).—Subcutaneous injection of Na cholate appears to increase the content of Ca in the brain, heart, liver, kidney, and muscles of rabbits but individual variations are very great. The Mg contents are tabulated.

NUTR. ABS. (m)

**Nature of union of sodium and potassium in the grey matter of the brain.** L. M. GEORGIEVSKAJA (J. Physiol. U.S.S.R., 1935, 19, 571—574).—Na and K probably occur in brain in salt-like combinations.

CH. ABS. (p)

**Total ash of sheep's bones as an index of calcification.** S. W. JOSLAND (New Zealand J. Sci. Tech., 1937, 18, 665—668).—The ash content of the head of the femur and of the proximal epiphysis of the humerus is a criterion of calcification in sheep. Calcification is complete in lambs 4—6 months old.

A. G. P.

**Structure of bones.** V. CAGLIOTI (Atti V Congr. Naz. Chim., 1936, 1, 320—330).—X-Ray measurements of ox bones show that the inorg. part has the approx. composition  $3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{CaCO}_3 \cdot x\text{H}_2\text{O}$ , with the hexagonal structure of hydroxyapatite,  $a$  9.2,  $c$  6.9 Å., the  $c$  axis being oriented parallel to the length of the bone. The org. part consists of polypeptide chains, supported and stretched by the inorg. crystallites. On decalcification the residual org. portion gives the X-ray pattern of stretched collagen.

O. J. W.

**Altmann-Gersh and freezing-drying method.** II. Mechanism of secretion of hydrochloric acid in the gastric mucosa. N. L. HOERR (Anat. Rec., 1936, 65, 417—436).—In the mucosa, the parietal cells are alkaline but the contents of the crypts are acid. The acidity increases up the lumen, being most marked at the level of the neck cells. The secretion of the parietal cells is a protein combined with HCl, which is set free by hydrolysis in the lumen.

NUTR. ABS. (m)

**Surface membranes of muscle fibres.** W. L. FRANCIS (Proc. Roy. Soc., 1937, B, 122, 140—154).—The p.d. observed when solutions approximating in composition to the interior of the muscle fibres are applied to the outside of the muscle (frog sartorius) show that a p.d., amounting to 10—20 mv., exists across the inner and outer surfaces of the membrane of the muscle fibres. Differences in  $[\text{K}^+]$  are largely, but not wholly, responsible for this.

F. A. A.

**Redox polarity of the amphibian egg and its relationship to the bioelectric polarity of the egg.** W. A. DORFMAN (Protoplasm, 1936, 25, 427—434).—The unfertilised egg shows a polar distribution of loci having different aerobic reduction potentials and different  $p_{\text{H}}$  vals. The reduction potentials are more negative where the  $p_{\text{H}}$  is lower, although the  $r_{\text{H}}$  vals. are practically the same at both poles.

M. A. B.

**Amphibian organisation centre.** V. Distribution and nature of glycogen in the amphibian

embryo. N. G. HEATLEY and P. E. LINDAHL. VI. Inductions by the evocator-glycogen complex in intact embryos and in ectoderm removed from the individuation field. N. G. HEATLEY, C. H. WADDINGTON, and J. NEEDHAM (Proc. Roy. Soc., 1937, B, 122, 395—402, 403—412).—V. Total glycogen (I), lyo-glycogen (II), and desmo-glycogen (III) and determined in the amphibian embryo around the period of gastrulation. Before gastrulation (I) concn. is highest at the animal and lowest at the vegetal pole. During gastrulation total (I) decreases slightly throughout the embryo, but markedly in the material invaginating through the dorsal lip of the blastopore. (III) does not decrease in one region more than in another and is therefore not identical with the fraction of (I) to which the evocator is attached.

VI. Both (II) and (III) preps. produce neural inductions in the amphibian embryo. The distinction between evocation and individuation has been studied by implanting evocator into isolated pieces of competent ectoderm.

E. A. H. R.

**Glutathione in [pathologically] altered liver.** L. BINET, G. WELLER, and H. GOUDARD (Compt. rend. Soc. Biol., 1937, 124, 1141—1143).—Glutathione is reduced by ligation of the bile duct, toxic hepatitis ( $\text{CHCl}_3$ , EtOH, and As), and fatty degeneration.

H. G. R.

**Free and combined acetylcholine in the brain.** E. CORTEGGIANI (Compt. rend. Soc. Biol., 1937, 124, 1197—1198).—If sheep's brain is heated to 70°, a three-fold increase in the acetylcholine content, due to decomp. of a complex, is observed. This increase is similar to that observed with  $\text{CCl}_3 \cdot \text{CO}_2\text{H}$  or  $\text{COMe}_2$  treatment.

H. G. R.

**Content of phosphorus compounds in the brain of animals.** N. V. BOLDIREVA (Biochimia, 1937, 2, 216—229).—The lipin and total P contents of the invertebrate brain are < those of the vertebrate. The nerve centres of snails and the brain of the tortoise contain only minute proportions of inorg. P and phosphagen (I) but the proportions of these forms of P in the nerve centres of the cockroach are > in those of some vertebrates. The protein-P contents of vertebrate and invertebrate brains are similar but that of birds is low. Male brains contain more inorg. P and (I) and less lipin and total P than do female brains.

W. McC.

**Histological studies on lipins.** I. Osmic acid as a microchemical reagent with special reference to lipins. II. Cytological analysis of the liposomes in the adrenal cortex of the guinea-pig. N. L. HOERR (Anat. Rec., 1936, 66, 149—171, 317—342).—I. Reduction of  $\text{OsO}_4$  by lipins (I) does not necessarily occur when frozen sections or embedded material is used, although the pure (I) may cause reduction. Reduction is max. with oleic acid or olein mixtures, the best reaction with tissues being obtained after fixation in  $\text{CH}_2\text{O}$ -Zenker or Regnaud's fluid and mordanting with  $\text{K}_2\text{Cr}_2\text{O}_7$ .  $\text{OsO}_4$  is also reduced by tissue reducing agents other than (I); it oxidises (I) to products insol. in (I) solvents, but prolonged treatment restores the solubility.

II. The morphological evidence does not sub-

stantiate any of the theories on the function of cortical (I). R. N. C.

**Effect of diet on the composition of feathers. Cholesterol content.** R. SALGUES (Compt. rend. Soc. Biol., 1937, **124**, 923—925).—The cholesterol content is greatest in the coloured plumage and decreases with the age of the bird. H. G. R.

**Marine products. V. Stigmasterol in molluscs.** W. BERGMANN (J. Biol. Chem., 1937, **118**, 499—501; cf. A., 1934, 404).—In addition to ostreasterol (I), the oyster, *Ostrea virginica*, contains small amounts of stigmasterol (II), the amount of which undergoes seasonal variation. (I) differs from (II) only in the position of the double linking, for it does not give  $\text{CHEtPr}^{\beta}\text{-CHO}$  or a similar product on treatment with  $\text{O}_3$ . J. N. A.

**Sterols of the starfish.**—See A., II, 148.

**Chitin and cellulose.**—See A., II, 233.

**Isolation of cyclopeptides from the proteins of the mollusc *Pecten islandicus*.** V. S. SADIKOV and R. J. KRISTALLINSKAJA (Biochimia, 1937, **2**, 146—150).—Extraction of the products of hydrolysis of the proteins for 10 min. (4%  $\text{H}_2\text{SO}_4$  at 220—225°) with  $\text{Et}_2\text{O}$  and  $\text{CHCl}_3$  yields cycloisovalylisovalyl-leucine. W. McC.

**Composition of the muscle of marine animals. V. Protein of the muscle of *Octopus vulgaris*, Lam. VI. Nitrogenous extractives of the muscle of *Palinurus vulgaris*, Latr.** A. CARTENI and A. MORELLI (Quad. Nutrizione, 1936, **3**, 225—226, 227—228).—V. 100 g. of the protein of the muscle of *O. vulgaris* contain: total N 15.96, amide-1.17, humin-0.38, arginine-2.55, histidine-0.26, cystine-0.38, lysine-2.27,  $\text{NH}_2$ - of the filtrate 8.77, and non- $\text{NH}_2$ -N of the filtrate 0.10 g.

VI. 100 g. of the fresh tissue of *P. vulgaris* contain: total extractive N 1.0375,  $\text{NH}_3$ -7.27, purine-8.34, albumin-4.73, creatine- and creatinine- nil, N of other bases 44.66,  $\text{NH}_2$ -acid-18.49, polypeptide-3.07, urea-N 12.70, undetermined N 0.74 g.

NUTR. ABS. (m)

**Isolation of amino-acids, peptides, and cyclopeptides from protein hydrolysates.** V. S. SADIKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, **14**, 313—315).—In order to avoid further decomp., protein hydrolysates containing large amounts of cyclic product etc. are separated thus: the  $\text{H}_2\text{SO}_4$  is neutralised by  $\text{Ca(OH)}_2$ , the  $\text{CaSO}_4$  paste is dehydrated with  $\text{EtOH}$  and calcined gypsum (I), and extracted with  $\text{Et}_2\text{O}$ ,  $\text{CHCl}_3$ , and  $\text{EtOAc}$  (extract cyclopeptides), then with  $\text{MeOH}$  (removes Ba salts of many  $\text{NH}_2$ -acids) and  $\text{H}_2\text{O}$  (extracts Ca salts of various  $\text{NH}_2$ -acids); the residue is digested with  $\text{H}_2\text{SO}_4$  and the extract neutralised with  $\text{CuCO}_3$  and evaporated; this residue is dehydrated by  $\text{EtOH}$  and (I) and extracted with  $\text{MeOH}$  and  $\text{COMe}_2$  (to remove various Cu salts and primary decomp. products); a final extraction with  $\text{H}_2\text{O}$  or dil.  $\text{AcOH}$  may be needed. Other salts may also be used. For hydrolysates containing mainly  $\text{NH}_2$ -acids: the  $\text{CaSO}_4$  paste is heated in dil. acid with an excess of urea or  $\text{KCNO}$ , the uramino-acids thus giving hydantoins; the  $\text{H}_2\text{SO}_4$  is then neutralised with  $\text{Ca(OH)}_2$  and

evaporated; the residue, dried at 50° is dehydrated with  $\text{EtOH}$ ; the  $\text{EtOH}$  extract is dried by (I) and evaporated, the residue thus obtained being extracted with  $\text{Et}_2\text{O}$  (removes cyclopeptides),  $\text{CHCl}_3$ ,  $\text{EtOAc}$ ,  $\text{MeOH}$ , and  $\text{COMe}_2$  (to remove cyclic compounds and hydantoins); the  $\text{CaSO}_4$  powder is boiled with  $\text{C}_6\text{H}_6$ ,  $\text{BuOH}$ , 1%  $\text{C}_6\text{H}_5\text{N-}$  or  $\text{NaOH-EtOH}$ , and, if necessary,  $\text{H}_2\text{O}$ , and aq. acid, alkali, or  $\text{NH}_3$ . Hydantoins are reconverted into  $\text{NH}_2$ -acids by  $\text{MgO}$ . R. S. C.

**Dissociation of ovalbumin in urea solvent.** J. W. WILLIAMS and C. C. WATSON (Nature, 1937, **139**, 506—507).—Sedimentation diagrams of ovalbumin (I) in  $\text{H}_2\text{O}$  buffered at  $p_H$  6.0 and in 50% aq. urea indicate that in the latter case (I) is dissociated into a mol. ( $S_{20} = 2.5 \times 10^{-13}$  cm. per sec. per dyne) of approx. half the mol. wt. found in  $\text{H}_2\text{O}$ . The dissociation appears to be reversible. L. S. T.

**Chemical structure of wool. I. Purification of keratin.** E. D. STACHEEVA-KAVERZNEVA and N. I. GAVRILOVA (Biochimia, 1937, **2**, 19—27).—Pancreatin-enterokinase digestion of wool separates it into digestible pericellular substance and undigested cells, containing respectively S 1.65—2.25 and 3.05, and N 16.3 and 14%. The N content of the  $\text{HCl}$  hydrolysates of the two fractions is distributed as follows:  $\text{NH}_2$ -groups 17.1 and 9.1, arginine 20.4 and 9.7, cystine 3.94 and 2.85, histidine 4.36 and 1.02, lysine 6.6 and 3.6,  $(\text{NH}_2)_1$ -acids 52.7 and 69.4, and  $(\text{NH}_2)_2$ -acids 48.5 and 38.9%. The ratio cystine-S/total S falls from 97.2% in the wool to 66.7% in the residue, pointing to transformation, possibly oxidative, of cystine during digestion. R. T.

**Constitution of the keratin molecule.** J. B. SPEAKMAN and F. TOWNEND (Nature, 1937, **139**, 411—412).—The glutamic and aspartic acid contents of Cotswold wool and seagull quill support the "salt-linkage" theory developed to account for the elastic properties of wool fibres in solutions of varying acidity. L. S. T.

**Racemisation curves of proteins of the muscles of certain invertebrates.** I. LEONTEEV and K. MARKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **14**, 441—443).—Proteins were extracted by 0.5N- $\text{NaOH}$  from the muscles of *Potamobius fluviatilis*, L., *Cucumaria frondosa*, Gunn., and *Pecten islandicus*, Müll. Their racemisation curves and chemical and physical characteristics are substantially the same. P. W. C.

**Isolation of muscle nuclei.** G. CROSSMON (Science, 1937, **85**, 250).—A method for the isolation of the nuclei of smooth, striated, and cardiac muscle is described. L. S. T.

**Bleaching of visual purple in solution.** G. WALD (Nature, 1937, **139**, 587—588).—Curves of the changes in the absorption spectrum of a solution of visual purple after exposure to light and then after keeping show the generally-accepted view, that the orange colour which is formed on exposure to light is due to a mixture of unbleached visual purple and final yellow product, to be incorrect. The orange colour is a new pigment that fades to yellow retinene in darkness. L. S. T.

**Carotenoid pigments in the eyes and "liver" organs of invertebrates.** E. LONNBERG (Ark. Zool., 1935, 28, A, No. 4, 14 pp.; No. 6, 4 pp.).—The eyes of birds belonging to the groups *Lari*, *Gressores*, *Limicolæ*, *Galli*, *Accipiteres*, *Passeres*, *Anseres*, *Striges*, and *Alectorides* and of fishes contain xanthophyll (I) or a carotenoid closely resembling it. Possibly (I) is related to the visual purple, its concn. being highest where great sensitivity to light is indispensable. The liver organs of molluscs and crustacea and the hepatic diverticula of sea stars contain a carotenoid similar to or identical with (I).

NUTR. ABS. (m)

**Preparation of pure cytochrome C from heart muscle and some of its properties.** D. KEILIN and E. F. HARTREE (Proc. Roy. Soc., 1937, B, 122, 298—308).—Cytochrome C (I) is extracted from finely minced heart muscle with  $\text{CCl}_3\text{CO}_2\text{H}$  and the extract fractionally pptd. with  $(\text{NH}_4)_2\text{SO}_4$ . Pure (I) so prepared contains 0.34% Fe and has a mol. wt. of 16,500. (I) reacts with  $\text{O}_2$  and CO only at  $p_{\text{H}} > 12$ . Reduced and oxidised (I) are  $\text{Fe}^{\text{II}}$  and  $\text{Fe}^{\text{III}}$  compounds. A reversible change in the absorption spectrum of oxidised (I) occurs on heating. (I) does not combine with  $\text{CN}^-$ ,  $\text{S}^{2-}$ ,  $\text{F}^-$ , azide, or peroxides, but oxidised (I) forms a reversible compound with NO. Some of the  $\text{NH}_2$ -acids in (I) are determined.

E. A. H. R.

**Colour reaction and iodometry of oxidisable [plant and animal] substances.** I. M. KONISHI (Okayama-Ig. Zasshi, 1935, 47, 1043—1057).—The colour reaction and iodometry of aq. extracts and expressed juice of plant and animal tissues are, in general, parallel but the intensity of reaction differs in different tissues. Oxidisable substances are converted into  $\text{EtOH}$ ,  $\text{COMe}_2$ , and  $\text{CN}$  compounds but not into  $\text{Et}_2\text{O}$ : they are precipitable by neutral  $\text{Pb}(\text{OAc})_2$  or phosphotungstic acid, labile toward sunlight and  $\text{H}_2\text{O}_2$ , absorbable by C but not by clay, and diffusible through membranes. The glutathione (I) content of plant tissues is < that of animal tissues. The I consumption of (I) is < that of (I)-containing oxidisable substances.

CH. ABS. (p)

**Porphyria.** I. Fox-squirrel, *Sciurus niger*. W. J. TURNER (J. Biol. Chem., 1937, 118, 519—530).—Current knowledge of porphyrias is reviewed. *S. niger* has a physiological porphyria extending into adult life, and uroporphyrin I (I) was extracted from the bones. The urine contained a small amount of coproporphyrin (II) and a metal complex, apparently of (I). (II) and protoporphyrin were present in the faeces.

J. N. A.

**Nature of the substance(s) producing pain in contracting skeletal muscle: bearing on angina pectoris and claudication.** L. N. KATZ, E. LINDNER, and H. LANDT (J. Clin. Invest., 1935, 14, 807—821).—The pain-producing substance is a product of muscle metabolism, is non-volatile and acidic; it diffuses into and out of the blood stream, may be transported from other body regions, and loses activity during training, possibly by lowering the buffer action of the muscle.

CH. ABS. (p)

**Heparin: a mucoitinpolysulphuric acid.** E. JORPES and S. BERGSTRÖM (J. Biol. Chem., 1937,

118, 447—457).—Some experiments on the acid hydrolysis, brucine fractionation, Ac and hexuronic acid contents of heparin (I) are described. (I) is not a definite chemical compound but a mucoitin polysulphuric ester containing at least a trisulphuric ester mixed with di- and mono-esters. The latter can be separated from the former as sol. brucine salts. The anticoagulating power of (I) must be due to its very strong ionic charge in combination with its mol. size.

P. W. C.

**State of activity of callicrein of the gastric glands and of the external secretion in dogs.** E. WERLE (Biochem. Z., 1937, 290, 129—134).—Callicrein (I) exists in the pancreas for the most part in an active form and a method avoiding autolytic processes is described which permits the separation of inactive (I). (I) is activated by the action of a thermolabile agent present in the intestinal mucosa. Inactive (I) is probably not present in the salivary glands.

P. W. C.

**Bee poison. III. Division into two components.** G. HAHN and H. LEDITSCHKE (Ber., 1937, 70, [B], 681—684; cf. this vol., 9, 57).—Dialysis of the portion of bee poison sol. in 60%  $\text{EtOH}$  and largely free from inactive ballast permits separation into a dialysable material (I) which produces cramp and a non-dialysable portion (II) which is toxic without causing cramp. (I) is inactivated by heating at 90—100° for 2 hr. at  $p_{\text{H}}$  4 or 12.6, whereas (II) remains unaffected.

H. W.

**Action of lachesis venom.** G. ESCOBAR (Semana med., 1935, II, 1479—1484).—The venom is a greenish opalescent, acid liquid having  $d$  1.03. It is stable and of low toxicity taken orally. It is inactivated at 65°, and contains protein, fat,  $\text{Cl}^-$ ,  $\text{PO}_4^{3-}$ , Ca,  $\text{NH}_4$ , and Mg. Its activity in solution is destroyed by light but the dried product is unaffected.

CH. ABS. (p)

**Effect of feeding seaweed on the iodine content of milk and dairy products.** G. LUNDE and K. CLOSS (Norsk Mag. Laegevidenskaben, 1936, 97, 377—394).—In cows receiving a supplement of 0.1—0.5 kg. of chopped dried seaweed daily the yield of milk and its fat content show negligible increases. <10% of the I of the fodder is normally excreted in the milk. The I content of the milk rises to a max. of 3.25 mg. per litre. The max. daily excretion of I in the milk is 40 mg. Approx. 90% of the I excreted in the milk is free, 3.8% is linked to the fat, and 6% to the protein. The fat of the milk of seaweed-fed cows contains approx. three times as much I as the fat of the milk of the controls. Consumption of the seaweed causes a seven-fold increase in the I content of the proteins, a ten-fold increase in that of the cheese, and a five-fold increase in that of the butter.

NUTR. ABS. (m)

**Distribution of phosphorus compounds in cows' milk.** P. A. KOMETIANI and T. E. TZULADZE (Biochimia, 1936, 1, 692—698).—Milk does not contain labile P compounds other than the complex  $\text{Ca}_3(\text{PO}_4)_2$ -casein. A difficultly hydrolysable fraction is recognised, but not identified.

R. T.

**Potassium in the milk of normal women.** A. LEULIER, L. REVOL, and R. PACCARD (Compt. rend. Soc. Biol., 1937, 124, 1114—1115).—The average vals. for morning, midday, and evening milks are 0.052, 0.059, and 0.054%, respectively.

H. G. R.

**Effect of light on the vitamin-C of milk.** S. K. KON (Science, 1937, 85, 119—120).—Under the action of light and in presence of  $O_2$ , the ascorbic acid (I) of milk undergoes reversible oxidation, probably to dehydroascorbic acid. Visible light of short  $\lambda$  (blue and violet) is mainly responsible for the reaction. The reversible reaction is unimol., and the reversibly oxidised product is biologically active. It decomposes spontaneously, without the action of light, to give a substance which fails to decolorise the indophenol reagent even after treatment with  $H_2S$ , and is biologically inactive. Synthetic (I) added to milk behaves in the same way. Pasteurisation by the holder method destroys the reversibly oxidised but does not affect the reduced form of (I) in milk. The amount of destruction of (I) by pasteurisation in absence of catalytic metals depends on the previous exposure of the milk to light.

L. S. T.

**Vitamin-C in pasteurised milk.** W. J. DANN and G. H. SATTERFIELD (Science, 1937, 85, 178—179).—Sharp's conclusions (this vol., 78) are criticised, and harmful effects of pasteurisation are discussed. In certain cases, the 2:6-dichlorophenol-indophenol titration is untrustworthy for the determination of vitamin-C in milk >3 days old.

L. S. T.

**Proteins of milk at different periods of lactation.** A. BIEBER (Riv. Clin. pediat., 1936, 34, 712—726).—The protein content of breast-milk is approx. const. throughout lactation.

NUTR. ABS. (m)

**Heat-denaturation of milk-albumin and -globulin.** S. J. ROWLAND (J. Dairy Res., 1937, 8, 1—5).—Heat-denaturation of milk-albumin plus -globulin was rapid at temp. >75°. At 80°, 90°, 95°, and 100° complete pptn. occurred in 60, 30, 10—15, and 5—10 min., respectively. No increase in non-protein-N occurred on heating to 100°, but continued heating at 95—100° formed some proteose. Appreciable hydrolysis of protein occurred at 115—120°.

W. L. D.

**Mastitis. IV. Composition of milk affected by latent mastitis.** A. C. DAHLBERG, J. J. KUCERA, J. C. HENNING, and G. J. HUCKER. **V. Presence of mastitis streptococci in mammary tissue.** G. J. HUCKER (N.Y. State Agric. Exp. Sta., Tech. Bulls. 239 and 241, 1936, 16 pp., 21 pp.).—The compositions of milk from healthy and from infected udders showed only slight differences regardless of the degree of infection as long as the milk remained normal in appearance. The slight changes consisted of decreases in lactose, *d*, solids-not-fat, and curd tension and increases in Cl and albumin. Mastitis milk of normal appearance is also normal in chemical composition.

W. L. D.

**Structure of milk-air interface.** N. KING (Milch. Forsch., 1937, 18, 331—338).—Microscopic observations in reflected light prove that fat globules

concentrate at the interface. This peculiarity is enhanced in milk with an oxidised flavour. The concn. of fat globules on the surface is favoured by freezing milk. Surface-active reagents poured on a milk surface are of two kinds, viz., those which spread evenly over the surface (oleic acid, triolein and soaps) and diminish the no. of milk fat globules and those which increase the concn. of globules at the surface ( $BuOH$ ,  $C_8H_{17}OH$ , and  $CH_2PhOH$ ).

W. L. D.

**Tryptophan reaction in the cerebrospinal fluid.** J. SPILLANE (Lancet, 1937, 232, 560—561).—In a clear cerebrospinal fluid a positive reaction is characteristic of tuberculous meningitis. The tryptophan may be synthesised by the tubercle bacilli in the fluid.

L. S. T.

**Albumins in cerebrospinal fluid.** H. MANGELSCHOTS (Compt. rend. Soc. Biol., 1937, 124, 1019—1022).—Pptn. with  $CCl_3CO_2H$  gives a higher val. for the albumin (I) content than that obtained by the precipitin method. The increase of (I) in meningitis is due to infiltration of serum-(I).

H. G. R.

**Phenols in biological fluids and their relation to phenolæmia.** M. F. CASTEX and A. F. ARNAUDO (Rev. assoc. med. Argentina, 1935, 49, 1063—1070).—The concn. of phenols in ascitic and pleural fluids (Theis and Benedict's method) is the same as that in blood.

CH. ABS. (p)

**Nature of the so-called droplets found between the rod outer segments of vertebrate eyes.** S. R. DETWILER and R. L. ZWEMER (Anat. Rec., 1937, 67, 295—303).—The droplets are lipin, and probably kephalin.

R. N. C.

**Lachrymal elimination of sodium chloride.** D. MICHAIL (Ann. Oculist., 1936, 173, 715—734).—The average NaCl content of tears from healthy eyes was 0.823%. The content fell in acute and rose in chronic diseases of the eye. Stimulation of the sympathetic nerve increased and that of the vagus nerve decreased the content. Ingestion of large amounts of NaCl increased the content whilst the action of diets poor in NaCl was variable. Lachrymal elimination of NaCl in both eyes was diminished by unilateral pericarotid sympathectomy. Increase in temp. produced by intramuscular injection of milk was paralleled by increase in the lachrymal NaCl content, which remained high, however, after the temp. had fallen.

NUTR. ABS. (m)

**Presence of a variable quantity of bromine in human saliva.** G. VITTE (Compt. rend. Soc., Biol., 1937, 124, 1227—1228).—Br is always present, but to a variable extent, in saliva.

H. G. R.

**Hormone content of saliva, using the bitterling test.** A. I. WEISMAN (Endocrinol., 1936, 20, 864—865).—The salivas from normal males and females and pregnant women contain no male hormone.

R. N. C.

**Salivary and stomach secretion of *Anopheles* and other mosquitoes.** A. DE BUCK (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 217—223).—The hæmagglutinin and anticoagulin in the salivary secretion of *A. maculipennis* are present in

the median acinus. The mid-gut of *Culex pipiens* and *Theobaldia annulata* contains a coagulin. In neither case was activity lost on prolonged drying or by dry heating at 99° but was destroyed by wet heating to 50°.

A. G. P.

Standards for determining the suitability of bile specimens for detection or release of typhoid carriers. F. C. FORSBECK and H. C. HOLLON (Amcr. J. Publ. Health, 1937, 27, 253—260).—Max. confidence may be placed in a negative laboratory report on bile in the above connexion, if it is amber, clear, viscous, and alkaline, provided it was obtained following  $\text{MgSO}_4$  stimulation and was protected in buffered broth.

O. M.

Gastric digestion of soya-bean flour. L. SHOPTAW, D. L. ESPE, and C. Y. CANNON (J. Dairy Sci., 1937, 20, 117—128).—In comparing a soya-bean gruel (soya-bean flour:  $\text{H}_2\text{O}$  = 1:9) with whole and skim milk for calf feeding, the amount of gastric juice secreted per  $\frac{1}{2}$  hr. and the amount of free and total acidity of the gastric contents were the same for each liquid food. The gruel leaves the stomach more rapidly than milk curd. Failure of calves to thrive on soya-bean gruel is not due to diminished gastric secretion.

W. L. D.

Intubation of human small intestine. IV. Chemical characteristics of intestinal contents in fasting and as influenced by administration of acids, alkalis, and water. W. G. CARR, W. O. ABBOTT, and A. B. SAMPLE (J. Clin. Invest., 1935, 14, 893—900).—After fasting, acidity is greatest in the duodenum, the reaction becoming neutral or alkaline in the ileum. Reaction and  $\text{HCO}_3^-$  content are related. The duodenal contents if acid or tending towards neutrality are hypertonic, but if neutral or alkaline tend towards the isotonic state of the ileal contents. After oral administration of acid, stomach contents passing into the duodenum are neutralised by  $\text{HCO}_3^-$  and become isotonic. Ingestion of isotonic  $\text{HCO}_3^-$  causes more rapid stomach evacuation than does that of hypertonic  $\text{HCO}_3^-$ . Administration of 400 c.c. of  $\text{H}_2\text{O}$  causes passage of stomach contents into the duodenum sufficiently rapidly to render the contents of the latter acid and to depress the osmotic pressure.

CH. ABS. (p)

Ammonia content,  $p_{\text{H}}$ , and carbon dioxide tension in the intestine of dogs. R. C. HERRIN (J. Biol. Chem., 1937, 118, 459—470).—Acidosis produced in dogs by a fat diet or administration of  $\text{CaCl}_2$  and  $\text{HCl}$  resulted in a 6—32% reduction of the concn. of fixed base in the succus entericus. Acidosis did not increase the  $\text{NH}_3$  content of the juice although urinary  $\text{NH}_3$  increased to 2—9 times normal. The juice is acid,  $p_{\text{H}}$  6—6.7, and the corresponding  $\text{CO}_2$  tension 30—279 mm. Hg. Diets containing various amounts of protein with accompanying change of intestinal  $\text{NH}_3$  concn. did not materially change the  $p_{\text{H}}$  or  $\text{CO}_2$  content of the succus entericus or jejunal contents.

P. W. C.

Occurrence of small amounts of cobalt in human urine. R. DUVAL and J. M. LE GOFF (Compt. rend., 1937, 204, 817—818).—Co ( $>0.05 \times 10^{-6}$  g.), when present as a simple salt, is pptd. from urine

by 1:2- $\text{NO}\cdot\text{C}_{10}\text{H}_8\cdot\text{OH}$  in  $\text{AcOH}$ ; when present as a complex salt, Co is first separated by electrolysis and dissolved from the Pt electrodes.

F. O. H.

Change in electrolytes of urine following injection of parathyroid extract. R. ELLSWORTH and W. M. NICHOLSON (J. Clin. Invest., 1935, 14, 823—827).—Injection of the extract increased the alkalinity and the inorg. P,  $\text{HCO}_3^-$ , Na, and K contents.  $\text{NH}_4^+$  decreased.

CH. ABS. (p)

Urea secretion. IX. Comparison of urea clearances calculated from the excretion of urea, of urea plus ammonia, and from nitrogen determination by hypobromite. D. D. VAN SLYKE, I. H. PAGE, A. HILLER, and E. KIRK (J. Clin. Invest., 1935, 14, 901—910; cf. A., 1933, 1181).—When the proportion of urea in the urea +  $\text{NH}_3$  fraction of human urine is decreased by  $\text{NH}_4\text{Cl}$ -acidosis and by low-protein diet, the urea clearance, calc. from the rate of excretion of urea alone, underwent a parallel reduction. When vals. for excreted urea +  $\text{NH}_3$  are substituted for urea the calc. clearances remain at the usual levels. The work of the kidneys is best indicated by the combined excretion of urea +  $\text{NH}_3$ .

CH. ABS. (p)

Micromethod for [determining] blood-urea; automatic urine collector for urea clearance in infants. L. E. FARR (J. Clin. Invest., 1935, 14, 911—913).

CH. ABS. (p)

Elimination of histamine and its absence from normal urine. G. UNGAR and A. POCOVLE (Compt. rend. Soc. Biol., 1937, 124, 1204—1206).—Histamine is eliminated in certain digestive secretions (gastric juice and bile) and not in the urine.

H. G. R.

Coefficients of correlation between the nitrogenous constituents of the urine after ingestion of low, normal, and high protein diets. H. H. BEARD (Human Biol., 1935, 7, 419—429).—The metabolic relations between total N and urea-,  $\text{NH}_3$ -, uric acid-, (I), and creatinine- (II) -N are close when a diet rich in protein is ingested. The relation between the excretion of urea-N and (I)- and (II)-N indicates a possible exogenous source of these substances. There is also a close relation between (I)- and (II)-N. It is possible that the greater is the intensity of  $\text{NH}_3$ -acid metabolism per unit of time the more are these substances derived from exogenous sources.

NUTR. ABS. (m)

Determination of oxalic acid in urine. S. OIKAWA (Japan. J. Med. Sci., 1937, II, 3, 211—216).—The urine (2 c.c.) is treated with 8 c.c. of 3%  $\text{CCl}_3\cdot\text{CO}_2\text{H}$  and 5 c.c. of the filtrate are pptd. with aq.  $\text{NaOH}\cdot\text{CaCl}_2$ . The ppt. is washed with dil.  $\text{NaOH}$ , dissolved in 10%  $\text{AcOH}$ , repptd. with  $\text{CeCl}_3$ , and the ppt. is washed with 1%  $\text{NaCl}$ , dissolved in 10%  $\text{H}_2\text{SO}_4$ , and treated with 0.01N- $\text{KMnO}_4$ , excess of which is determined iodometrically. The use of a centrifuge tube with a diverticulum is essential (cf. Maugeri, A., 1933, 850).

F. O. H.

Daily excretion of oxalic acid in urine. S. OIKAWA (Japan. J. Med. Sci., 1937, II, 3, 217—219).—The 24-hr. excretion of  $\text{H}_2\text{C}_2\text{O}_4$  in adults is approx. 30—40 mg.

F. O. H.

**Renal elimination of bilirubin.** A. E. RAICES and C. V. SUAREZ (Rev. med. quir. patol. femenina, 1935, 5, 559—577).—Urinary elimination of bilirubin (I) is abnormal and depends on the (I) concn. in blood. No threshold for (I) elimination by kidneys was found. CH. ABS. (p)

**Proteinuria. "Albuminuria."** J. BING (Acta med. scand., 1936, 89, Suppl. 76, 151 pp.).—Urinary albumin (I) and globulin excretion varies with the creatinine clearance. The calc. average protein (II) content of the glomeruli is const. under const. experimental conditions, but different vals. are found in different individuals. The degree of proteinuria depends on the filtration val. and on the permeability of the glomerular membrane. There is parallelism under const. conditions between (II) excretion, urea excretion, and cholesteroluria. The relative urinary (I) content depends on the relative (I) content of the blood and on the ratio of the relative (I) contents of blood and urine. The dietary (I) content affects the permeability of the glomerular membrane. The relative urinary (I) content varies little in the various forms of Bright's disease. NUTR. ABS. (m)

**Excretion of calcium.** H. CHRISTIANSEN (Diss., Copenhagen, 1936, 108 pp.).—Ca absorption is controlled by intestinal  $p_H$ . In fasting rabbits and rats on a Ca-free diet, there is a steady but somewhat variable excretion of Ca from the gut. Of this a const. small part is derived from bile. Intravenous injection of  $\text{CaCl}_2$  in a goat did not affect bile-Ca. Prolonged slow intravenous injection of  $\text{CaCl}_2$  (13—103 mg. per hr.) into rabbits and goats causes no increase in faecal Ca excretion. Urinary Ca excretion increased, 15—35% of the injected Ca being thus excreted in rabbits, and 6—11% in goats. Thus faecal Ca represents unabsorbed dietary Ca plus a small proportion derived from bile and other intestinal secretions only; there is no active excretion into the gut. Only very small increases in serum-Ca occur and the Ca content of soft tissues (other than kidney) does not increase. Subcutaneous injections of  $\text{CaCl}_2$  and Ca gluconate cause severe uræmia and extensive deposition of Ca in the kidneys. NUTR. ABS. (m)

**Reaction of the fæces of children.** I. Determination of faecal  $p_H$ . Effect of diet. II. Cause of faecal  $p_H$ . R. PACHIOLO and V. MENGOLI (Pediatrics [Riv.], 1935, 43, 617—641, 1025—1045).—I. The  $p_H$  of the fresh fæces of breast-fed infants was 4.8—6.9 (average 5.6). In children on a diet of cow's milk, cereal, or bread the vals. were 6.03—7.60. In children > 2 years old on a mixed diet, the vals. were 6.3—8.1 (average 7.21).

II. Faecal  $p_H$  is determined by the nature of the fermentable material, the buffering power of the ingested food, the bacteria, the absorptive and secretory power, and motility of the intestine, and the original acids, Ca, and  $\text{PO}_4'''$  which act as buffers in the fæces. NUTR. ABS. (m)

**Fæcal flora and the line test of normal, rachitic, and healing rachitic rats.** H. FRIEDMANN (J. Nutrition, 1936, 12, 165—172).—In all these cases the faecal  $p_H$  reflected changes in bacterial flora and, with known diets, served as an index of the tendency

towards rickets or healing. Rachitic stools were alkaline and contained fewer *B. coli* than did the acid stools of normal and healing rats. Vitamin-D in pasteurised and certified milk and that in irradiated ergosterol effected similar changes in rat fæces.

A. G. P.

**Sweating and the permeability of the human skin.** Report to the committee on "the control of atmospheric conditions in hot and deep mines." A. G. R. WHITEHOUSE (Trans. Inst. Min. Eng., 1937, 93, 18—36).—Curves show that the loss in wt. of a subject by osmotic passage of  $\text{H}_2\text{O}$  through the skin is negligible in ordinary  $\text{H}_2\text{O}$  baths at 91—93° F., is considerable in salt  $\text{H}_2\text{O}$  baths, and still greater in air, both naked and clothed. Increased air temp. leads to increased loss of  $\text{H}_2\text{O}$  due to increased circulation and gaseous exchange through the skin. The intact human skin is completely impermeable to electrolytes in simple solution, but non-ionised I is absorbed. The amount of sweating is not only due to rise in body temp. but is also facilitated by the performance of work, due probably to the effect of some product of metabolism. Sweat usually contains Cl' 0.1—0.2%, K 0.014—0.026%,  $\text{SO}_4'''$  0.004%, lactic acid 0.07—0.13%, urea 0.023—0.046%, and traces of Ca, Mg, sugar, uric acid, and creatinine. Sweat from the leg and lower part of the back had a  $p_H$  of 4.6, from the chest 5.2, and from face and armpits 7.0. The acidity decreases with washing of the surface, sweat owing its acidity to contact with the skin, the surface of which is normally strongly acidic. P. W. C.

**Gastric pepsin in various diseases.** C. R. MULLINS and C. A. FLOOD (J. Clin. Invest., 1935, 14, 793—797).—Variations in peptic activity of gastric contents in diseases are examined.

CH. ABS. (p)

**Oxalic acid metabolism in some diseases.** S. KAMIYA (Japan. J. Med. Sci., 1937, II, 3, 163—169).—Normal human blood contains 0.003—0.004% of  $\text{H}_2\text{C}_2\text{O}_4$  (Suzuki, A., 1934, 1122) but the level is often increased in certain diseases (e.g., hepatic cirrhosis, syphilis, beri-beri, hypertension).

F. O. H.

**Resistance to proteolysis found in blood-serum of aborting women.** E. SHUTE (J. Obstet. Gynaecol. Brit. Empire, 1935, 42, 1071—1084).—In many cases of spontaneous abortion the serum showed high resistance to the proteolytic action of commercial trypsin, notably to its protease fraction. A small proportion of pregnancies and self-induced abortion showed similar effects. Spontaneous abortion may be provoked by excessive ability of normal blood to impede proteolysis. Maternal resistance is not due to serum-antitrypsin. CH. ABS. (p)

**Is œstrin the cause of resistance to proteolysis found in serum of aborting women?** E. SHUTE (J. Obstet. Gynaecol. Brit. Empire, 1935, 42, 1085—1095).—A substance resembling œstrin occurs in normal blood and causes resistance to proteolysis in spontaneous abortion. The concn. of this substance in placentas of aborting women is > in more mature placentas. CH. ABS. (p)

**Relation between hypochromic anæmias and iron-deficiency.** J. F. BROCK (Brit. Med. J., 1937, 315—320).—Effects of Fe therapy are recorded and the importance of excessive dosages of Fe in some cases is emphasised.

A. G. P.

**Relation of calcium and iron to the erythrocyte and hæmoglobin content of blood of rats consuming a mineral-deficient ration.** J. M. ORTEN, A. H. SMITH, and L. B. MENDEL (J. Nutrition, 1936, 12, 373—385).—Polycythæmia and anæmia in rats caused by feeding rations deficient in inorg. salts are alleviated by a complete salt supplement, are partly prevented by  $\text{CaCO}_3$  and (less uniformly) by  $\text{FeCl}_3$ . No other constituent of the salt mixture (with the possible exception of P) is concerned in these changes.

A. G. P.

**Treatment of severe iron deficiency and hæmorrhagic anæmia. Restoration of iron reserves.** G. FONTES and L. THIVOLLE (Sang, 1936, No. 2, 144—177).—In normal adult dogs the partition of Fe is approx. as follows: 44% as hæmoglobin (I), 11% in liver and spleen, and 44% in other tissues and organs. Repeated bleedings cause reduction in the Fe contents of the liver, spleen, skeleton, skin, and viscera, but scarcely affect that of muscle. Hence tissue-Fe, other than that of muscle, appears to act as a reserve that can be used for blood production. After six weeks' treatment with Fe and Cu caseinate, blood-Fe is normal but tissue-Fe, other than that of muscle, is low. Liver and spleen show no reserves. After treatment for 5—12 months with Fe caseinate alone, tissue-Fe increases to 50% of its normal val. Increase of dosage does not affect the result. The urinary C:N ratio, which is high in anæmia, is restored to normal by the Fe administration and storage of N occurs. In severe secondary anæmia in man, Fe and Cu with tryptophan and histidine should be given until the (I) level is normal, after which Fe treatment should be continued for a long time.

NUTR. ABS. (m)

**New factor in the production and cure of certain macrocytic anæmias.** L. WILLS, P. W. CLUTTERBUCK, and B. D. F. EVANS (Lancet, 1937, 232, 311—314).—Two factors, one sol. and one insol. in saturated  $(\text{NH}_4)_2\text{SO}_4$ , have been separated from the liver extract campolon. When administered parenterally, the sol. fraction is curative in the nutritional macrocytic anæmia of rhesus monkeys; the insol. fraction, which contains the anahæmin (I) present in campolon, is inactive in the monkey anæmia, as are also the commercial preps. of (I), but is curative in pernicious anæmia. Similar fractionation of the alcohol-sol. fraction of acidified aq. yeast extracts yields an insol. fraction inactive in monkey anæmia and a sol. active fraction. Both factors appear to be necessary for hæmopoiesis in man and rhesus monkeys, but in the production and cure of the nutritional anæmia of the monkey it is the sol. fraction which is mainly concerned. The possible relationship of the new factor to the vitamin- $B_2$  complex is discussed.

L. S. T.

**Synovial fluid in chronic arthritis.** D. H. COLLINS (J. State Med., 1935, 43, 652—657).—Pathological examination of the fluid in arthritis

should include determination of sugar (lowered with bacterial contamination), protein (high, with high cellular content), and polymorphonuclear leucocytes (varying with type of arthritis).

CH. ABS. (p)

**Riboflavin deficiency in dogs.** W. H. SEBRELL, R. H. ONSTOTT, and D. J. HUNT (U.S. Publ. Health Rep., 1937, 52, 427—433).—A special rice-bran filtrate rich in the "filtrate factor" and free from riboflavin showed curative action in black-tongue of dogs. Some evidence is presented that riboflavin is essential in the diet of dogs.

W. L. D.

**Report of chemistry section.** B. C. ASTON (New Zealand Dept. Agric. Ann. Rep., 1934—1935, 60—65).—Livers and blood of bush-sick sheep were not deficient in Cu. Prolonged drenching of healthy sheep with  $\text{CuSO}_4$  induced bush sickness. Some cases of sickness were temporarily cured by administration of As. The As contents of grass were the same (0.1—0.7 p.p.m.) in sick and healthy areas.

Analyses of pampas grass are recorded.

A renal calculus from sheep contained Ca phosphate with smaller amounts of  $\text{SiO}_2$ , uric acid, and pigment. Others from cows contained  $\text{Mg NH}_4$  phosphate, fat, and pigment in one case, and  $\text{SiO}_2$ ,  $\text{CaCO}_3$ , cystine, and Ca phosphate in another.

CH. ABS. (p)

**"Trace elements" in relation to bush sickness.** E. M. WALL (New Zealand J. Sci. Tech., 1937, 18, 642—650).—Recorded beneficial effects of Fe  $\text{NH}_4$  citrate preps. and of limonite in bush sickness are attributed to their Co contents. Highly purified samples have no action unless Co is added. Probably catalytic trace elements other than Cu and Co (e.g., Mn, Ni, or Zn) are necessary for the effective utilisation of Fe in soil and pasture by sheep.

A. G. P.

**Cobalt content of limonites used in the treatment of bush sickness.** K. J. MCNAUGHT (New Zealand J. Sci. Tech., 1937, 18, 655—661).—The deficiency of Co (determination described) in soils of bush-sick areas is confirmed. The curative efficiency of limonites is paralleled by their Co contents.

A. G. P.

**Sodium and potassium metabolism. Effect of potassium on sodium and water balances in normal subjects and patients with Bright's disease.** E. M. MACKAY and A. M. BUTLER (J. Clin. Invest., 1935, 14, 923—939).—Ingestion of 5—10 g. of KCl daily did not affect the excretion of Na or œdema fluid, and in Bright's disease had no appreciable effect on Na retention and development of œdema.

CH. ABS. (p)

**Dietary protein in hæmorrhagic Bright's disease. II. Effect of diet on serum-proteins, proteinuria, and tissue-proteins.** E. H. KEUTMANN, S. H. BASSETT, G. E. JULIAN, C. H. PRESENT, and H. E. VAN ALSTINE (J. Clin. Invest., 1935, 14, 871—878).—Protein balances in patients with Bright's disease receiving a basal diet + protein indicate previous depletion of tissue-protein. Small supplements of egg-white or serum-protein were more efficient than large supplements in this respect. Lactalbumin and liver-protein were equally utilised. Increased protein intake caused increased albuminuria.

CH. ABS. (p)

(A) Inverse relation between growth and incidence of cataract in rats given graded amounts of foods containing vitamin- $B_2$ . P. L. DAY and W. J. DARBY. (B) Blood-sugar in rats rendered cataractous by dietary procedures. P. L. DAY (J. Nutrition, 1936, 12, 387—394, 395—404).—(A) Rate of growth and incidence of cataract were inversely related. Small amounts of vitamin- $B_2$  prevent the appearance of cataract.

(B) Cataract produced by  $B_2$  deficiency is associated with sub-normal blood-sugar levels and differs from that resulting from feeding lactose or galactose.

A. G. P.

Effect of X-rays on the carcinogenic action of methylcholanthrene. E. TASCHNER, G. GOTTLIEB, and M. SPRITZER (Compt. rend. Soc. Biol., 1937, 124, 955—956).—Small doses of X-rays inhibit, and larger doses accelerate, the carcinogenic action in mice.

H. G. R.

Chemotherapy of cancer by complex soluble salts of copper and titanium with ascorbic or dehydroascorbic acid. F. ARLOING, A. MOREL, and A. JOSSERAND (Compt. rend., 1937, 204, 824—825; cf. A., 1936, 100).—Positive clinical results were obtained with Ti-Na complex salts of ascorbic and dehydroascorbic acid (I) and with  $Cu^{II}$ -Na complex salt of (I).

F. O. H.

Application of the polarographic effect of proteins in cancer diagnosis. R. BRDIČKA (Nature, 1937, 139, 330).—The polarographic protein effect, consisting of a characteristic wave on the current-voltage curve, is always greater with normal than with carcinomatous serum.

L. S. T.

Nature of the causative agent of the Rous fowl sarcoma. E. M. FRAENKEL and C. A. MAWSON (Nature, 1937, 139, 282).—Deposition of the agent from extracts of Rous sarcoma by centrifuging at 15,000 r.p.m. has been confirmed, but a satisfactory correlation between the no. of elementary bodies in different active preps. and the infectivity of the extracts has not been obtained. Only a small % of the elementary bodies visible in the extract can be associated with its activity; the active agent may be adsorbed on the surface of such particles. Tumours were not obtained by injection of  $COMe_2$  extracts of fresh tumour or dried sarcoma powder (cf. A., 1936, 1406), but the residue left after extraction of dried powder retains its carcinogenic properties. L. S. T.

Preparation of an active agent from inactive tumour extracts. A. CLAUDE (Science, 1937, 85, 294—295).—The active agent of chicken tumour I can be separated from its own inhibitor by high-speed centrifuging.

L. S. T.

Excessive dental calculus formation. J. N. FINNI and J. S. GOTTLIEB (Dental Cosmos, 1935, 77, 1173—1176).—Calculi enveloping crowns of lower teeth contain  $CaCO_3$ ,  $CaC_2O_4$ , Ca phosphate, and mucin.

CH. ABS. (p)

Facial dermatitis in sheep in New Zealand. Photosensitivity of unpigmented skin. C. S. M. HOPKIRK (New Zealand J. Agric., 1936, 52, 98—103).—The dermatitis in South Island is attributed to consumption of a particular plant, probably a species

of *Hypericum*. In North Island the disease is associated with liver damage and the absorption of a fluorescent substance (produced by breakdown of chlorophyll) which sensitises the skin to light. A. G. P.

Protamine-zinc-insulin and other mixtures of zinc and insulin in diabetes mellitus. I. M. RABINOWITZ, J. S. FOSTER, A. F. FOWLER, and A. C. CORCORAN (Canad. Med. Assoc. J., 1936, 35, 239—252).—Protamine-Zn-insulin has a more prolonged hypoglycaemic effect than protamine-insulin in acute experiments and in diabetics on diet. The average blood-sugar vals. of 10 diabetic patients were 0.285, 0.189, and 0.131 mg. per 100 ml., respectively, after treatment with insulin, protamine-insulin, and protamine-Zn-insulin. Diabetics under treatment with protamine-Zn-insulin showed the most satisfactory levels of blood-cholesterol. Probably the addition of Zn increases the sensitivity of the diabetic to insulin.

NUTR. ABS. (m)

Relation of blood-glucose to concentration of lactose in milk of lactating diabetic women. E. TOLSTOI (J. Clin. Invest., 1935, 14, 863—866).—Lactose in the milk remained at a remarkably const. level despite marked variation in blood-glucose.

CH. ABS. (p)

Temperature of glucose solution and "superabundance" diabetes. M. WIERZUCHOWSKI (Compt. rend. Soc. Biol., 1937, 124, 1136—1138).—This form of diabetes (cf. A., 1935, 1008) is produced by intravenous injection of glucose in the dog above the limit of assimilation, a temp. of 26° being the most suitable.

H. G. R.

Vitamin- $B_1$  and diphtheria. B. A. PETERS and R. N. CUNNINGHAM (Lancet, 1937, 232, 563—564).—The stage of glycolysis in which vitamin- $B_1$  is concerned is not affected by the diphtheria toxin, and no benefit arises from its administration. L. S. T.

Summer encephalitis in Japan. S. NAKA, N. OKUMURA, and G. KAKIHARA (Fukuoka Ikwa. Zasshi, 1934, 27, 1499—1522).—Blood-acidosis was high in the delirious and comatose state but inclined to alkalosis during convalescence. Blood- $p_H$  was not appreciably lowered. In the spinal fluid,  $p_H$  was raised, residual N was greatly and albumin slightly increased.

CH. ABS. (p)

Genesis of thyroid protein: clinical assays of artificial thyroid protein in human myxoedema. W. T. SALTER and J. LERMAN (Endocrinol., 1936, 20, 801—808).—The thyroglobulin (I) extracted from human thyroid glands from a non-endemic goitre district has only  $\frac{1}{4}$  of its I combined as thyroxine (II). The non-(II) ("di-iodotyrosine") fraction is converted by pepsin under appropriate conditions into an artificial protein resembling (I) chemically and clinically. The non-(II) fraction probably represents a chemical precursor of (II).

R. N. C.

Treatment of arterial hypertension with octyl alcohol. C. R. BELGRANO (Semana med., 1935, II, 1073—1080).—Intravenous injection of the alcohol (1:10,000) caused a slight hydræmia and a decrease in blood-urea and -Cl.

CH. ABS. (p)

**Mandelic acid in treatment of urinary infections.** D. M. LYON and D. M. DUNLOP (Brit. Med. J., 1935, II, 1096—1097).—Na mandelate produced urinary antiseptics. CH. ABS. (p)

**Survival of marmots after nephrectomy and adrenalectomy.** S. W. BRITTON and H. SILVETTE (Science, 1937, 85, 262—263).—Summer-nephrectomised marmots show considerable reductions in serum-Na and -Cl and more marked rises in blood-urea than the winter-operated animals. L. S. T.

**Isoglycaemic curves in obesity.** P. B. LANDABURE and J. A. PANGARO (Semana med., 1935, II, 1293—1298).—Administration of sugar to obese persons induces a diabetic glucose curve in some cases. In others, usually young persons with endocrine disturbance, there is little or no hyperglycaemia and vals. return to normal or to lower levels. CH. ABS. (p)

**Glaucoma and oedema.** H. SCHROEDER (Eye, Ear, Nose and Throat Monthly, 1935, 14, 369—373).—Relations between glaucoma and vitamin-B deficiency, NaCl, nutritional and angioneurotic oedema are discussed. CH. ABS. (p)

**Isolation of a homogeneous heavy protein from virus-induced rabbit papillomas.** J. W. BEARD and R. W. G. WYCKOFF (Science, 1937, 85, 201—202).—A protein of high mol. wt., sedimentation const. approx.  $250 \times 10^{-13}$  cm. per sec. per dyne, has been isolated by ultracentrifuge from the virus-induced warty masses from cottontail rabbits. The protein contains approx. 15% of N and is completely coagulated at 66—67°. It is several thousand times as infectious as the wart tissues from which it is derived. L. S. T.

**Phlyctenular disease and vitamin deficiency.** L. G. REDDING (Pennsylvania Med. J., 1935, 39, 173—175).—The disease is associated with vitamin-A deficiency and is successfully treated with large doses of cod-liver oil. CH. ABS. (p)

**Defensive role of bilirubinæmia in pneumococcal infection.** NAJIB-FARAH (Lancet, 1937, 232, 505—506).—The blood of patients suffering from acute rheumatism contained abnormal amounts of bilirubin (I). Growth of virulent pneumococci in rabbit or human sera is inhibited by addition of (I). Some varieties of pneumococcus are agglutinable and sol. in solutions of (I), whilst others are not. Solubility  $\propto$  virulence. L. S. T.

**Effect of polyneuritis in chicks on the *in vitro* rate of removal of pyruvate injected intravenously.** W. C. SHERMAN and C. A. ELVEHJEM (J. Nutrition, 1936, 12, 321—328).—The amount of  $\text{NaHSO}_3$ -fixing substance in chick blood is not increased by avitaminosis- $B_1$ ; that of faeces increases in polyneuritis. Intravenously injected pyruvate (I) is removed from the blood rapidly in normal, but slowly in polyneuritic, chicks. Polyneuritis is associated with a disturbance of the metabolism of (I) in the tissues. A. G. P.

**Effect of occupation on blood-phosphate and -calcium in pregnancy.** G. IOHOK and G. TOUS-SAINT (Rev. Hyg. Med. prev., 1936, 58, 435—453).—Occupation influences the Ca, total P, and inorg. P

of the blood of pregnant women. Changes are most noticeable when the hrs. of employment are long, where the work is arduous, and, in some cases, where chemicals are handled. NUTR. ABS. (m)

**Changes in inorganic phosphate content of the blood in pregnancy.** S. LEHWIRTH (Zentr. Gynakol., 1936, 60, 1882—1885).—In pregnancy until the 7th month there is an increase averaging 26% > normal val. for the blood-inorg.  $\text{PO}_4'''$ , and in the last stages there is a further increase to an average of 44% > normal. During the 10-day period *post partum* there is a gradual fall in the val. to about 34% > normal. NUTR. ABS. (m)

**Potassium metabolism in normal and toxæmic pregnancy.** F. SZUSZ (Zentr. Gynakol., 1936, 60, 2310—2313).—In each case 5 ml. of sterile 3% aq. KCl were injected into the cubital vein. In pregnancy toxæmia the K<sup>+</sup> content of the whole blood fell by about 15% within 30 min. and then rose to approx. the normal level at 60 min. In normal pregnancy half the cases examined showed similar changes, whereas in the other half the K<sup>+</sup> rose by approx. 10—20% and then fell slowly. After the cessation of the toxæmia the curves showed a rise similar to that for the second half of normal cases. NUTR. ABS. (m)

**Blood-polypeptides in the pregnant woman and the foetus.** G. LEGRAND (Brux. méd., 1936, 16, 1131—1137).—During pregnancy the large polypeptide mols. of maternal serum are replaced by simpler mols. which are readily dialysable and can be used by the foetus. During labour and the puerperium there is an increase in blood-polypeptides secondary to absorption of protein. NUTR. ABS. (m)

**Addis sediment count and blood-urea clearance test in normal pregnant women.** C. A. ELDEN and J. W. COONEY (J. Clin. Invest., 1935, 14, 889—891).—The lower limit of normal urea clearance is somewhat smaller in pregnant than in non-pregnant women. CH. ABS. (p)

**Serum-calcium in the psychoses.** I. ATKIN (Lancet, 1937, 232, 439—440).—Ca levels associated with various psychoses are recorded. L. S. T.

**Calcium and phosphorus metabolism in intractable rickets.** W. J. HIGHMAN, jun., and B. HAMILTON (J. Pediat., 1936, 9, 56—61).—In a 10-year-old girl with marked rickets since the age of 2 years the chief disorder of metabolism was marked loss of P in the faeces. Increase of P intake caused a fall in faecal P but only with 100 drops of viosterol (I) daily was there retention. On a low-Ca diet with 30 drops of (I) daily there was Ca equilibrium. Possibly inability to utilise vitamin-D was the cause of the condition. NUTR. ABS. (m)

**Variation in the phosphorus and carbohydrate derivatives of rat's muscle during experimental rickets and its cure.** R. DUFFAU (Compt. rend. Soc. Biol., 1937, 124, 1194—1197).—An increase in  $\text{PO}_4'''$ , which is considerably augmented if  $\text{H}_3\text{PO}_4$  or Na  $\beta$ -glycerophosphate is fed, and a decrease on vitamin-D therapy were observed. Little variation in the labile P compounds, carbohydrate derivatives, or lactic acid occurred. H. G. R.

**Rachitogenic diets.** A. L. BACHARACH (Z. Vitaminforsch., 1937, 6, 129—140).—The intensity of the rickets, the regularity of this intensity, and the response to antirachitic treatment differ considerably in the rickets produced in rats by diet 2965 of Steenbock and the modified diet 401 of Pappenheimer (Jephcott and Bacharach, B., 1926, 718). Bone composition appears to be influenced by differences in age and sex. F. O. H.

**Mineral content of blood and bones in experimental scurvy in guinea-pigs.** H. KAPP and A. SCHETTY (Biochem. Z., 1937, 290, 58—61).—Tables show the changes of K, Ca, Mg, Cl', and  $\text{PO}_4'''$  contents of blood and bones of guinea-pigs during establishment of scurvy. Well-defined and regular changes do not occur, but a decrease of blood-K is usual and probably related to anaemia and consequent loss of K-rich erythrocytes. Very slight decreases of Ca and  $\text{PO}_4$  appear in bones, but the essential changes must be in the org. structure. P. W. C.

**Occurrence of silicosis in the manufacture of silicon alloys.** T. BRUCE (J. Ind. Hyg., 1937, 19, 155—162).—Workmen in two different Swedish plants manufacturing Si alloys show early silicosis, due to finely divided  $\text{SiO}_2$  in the atm., after 4 and 14 years respectively; this variation is attributed to differences in the efficiency of exhaust-hoods etc. F. A. A.

**Quartz in industrial dusts and deposits on human lung tissues; X-ray diffraction, chemical and spectrographic studies.** V. HICKS, O. MC-ELROY, and M. E. WARGA (J. Ind. Hyg., 1937, 19, 177—186).—Data are given for the occurrence of various elements, and the amounts of Si and  $\text{SiO}_2$ , in dusts collected from different sources, and in deposits obtained, after trypsin digestion, from human lung tissue, in Pittsburgh.  $\text{SiO}_2$  may be detected in X-ray analysis of lung tissue diagnosed clinically as non-silicotic, and in which the  $\text{SiO}_2$  content, determined chemically, is only 0.14% of dried material. F. A. A.

**Silicosis.** W. D. McNALLY and W. L. BERGMAN (Ind. Med., 1935, 4, 61—65).—Fibrosis in silicosis may result from the action of NaF in the blood on  $\text{SiO}_2$ . Dusts become more harmful as their  $\text{SiF}_4$  content is increased. CH. ABS. (p)

**Report of Wallaceville veterinary laboratory.** C. S. M. HOPKIRK (New Zealand Dept. Agric. Ann. Rept., 1934—1935, 25—31).—Composition of rumen gases in tympany of dairy cows is examined. No excessive amounts of HCN appeared in the case of bloated cows.

Grass staggers was corr. by increasing the blood-Mg by feeding dolomite (I).  $\text{MgSO}_4$  was more effective than (I) in increasing the Mg content of herbage. Affected animals showed normal amounts of Mg in milk and bones but urinary Mg was low.

Sheep affected with Morton Mains disease had subnormal blood-P and -total solids but normal -Ca and -Mg.

Vitamin-D contents of eel body, ling liver, proper liver, and red cod-liver oils were, 47, 500, 2250, and 10 international units per g., respectively. Whale body oil contained no -D. The -A content of fresh grass  
O (A., III.)

was > that of hay; -D contents were the same in both. CH. ABS. (p)

**Arsenic-detoxin compounds.** W. A. COLLIER and M. J. VERHOOG (Z. Immunitats., 1937, 90, 43—57).—Among compounds of hydrolysed keratin with hydroxy-, amino-, and aminohydroxy-phenylarsenoxides one (As XIII) showed therapeutic activity > that of neosalvarsan against recurrent fever, dourine, and nagana. The prophylactic effect is small. A series of Sb compounds analogous to the As compounds has notably less effect on nagana. C. R. S.

**Lipin content of caseous tubercles.** S. NARASAKA and M. NAITO (Japan. J. Med. Sci., 1937, II, 3, 189—194).—The contents of total fatty acid and total and free cholesterol of caseous tubercles in man (kidney, lymphatic gland) are >, whilst that of lecithin is <, those of the surrounding tissue. F. O. H.

**Chemotherapy of typhoid and some other non-streptococcal infections in mice.** G. A. H. BUTTLE, H. J. PARISH, M. MCLEOD, and D. STEPHENSON (Lancet, 1937, 232, 681—685).—Early oral administration of  $p\text{-NH}_2\text{-C}_6\text{H}_4\text{-SO}_2\text{-NH}_2$  (I) prevents or delays the development of septicæmia and death in mice infected with *B. typhosum*, *B. paratyphosum* B., *B. aertrycke*, Friedlander's bacillus, and pneumococcus, according to the nature of the organism. (I) has an inhibitory effect on the multiplication of small nos. of certain of these organisms in broth medium and in deulococcyted blood. L. S. T.

**Base changes in the alkalosis produced by treatment of gastric ulcer with alkalis.** C. L. COPE (Clin. Sci., 1936, 2, 287—300).—The treatment caused increase in the total base content of the serum and the serum-Ca val. reached 16 mg. per 100 ml. This was accompanied by increase in serum-P to 6 and in serum-Mg to 2.8 mg. per 100 ml. The symptoms usually disappeared with return of the inorg. constituents of the blood to normal levels. N retention persisted longer. NUTR. ABS. (m)

**Sodium and chlorine in extrarenal uræmia.** P. SCHOORL (Tijdschr. Diergeneesk., 1936, 63, 1112—1114).—On the basis of the successful treatment of the uræmia of Addison's disease with Na salts but not with chlorides other than NaCl and experimental production of uræmia in rats on a diet deficient in Na it is suggested that it is primarily Na that is concerned with N metabolism. NUTR. ABS. (m)

**Biochemistry and reversibility in evolution.** J. NEEDHAM (Biochimia, 1937, 2, 479—488).—A review. W. McC.

**Bio-catalysis. I—III.** R. BRINKMAN (Chem. Weekblad, 1937, 34, 215—217, 251—252, 284—285).—Review and discussion of respiration, autoxidation, etc. S. C.

**Relation of season, sex, and weight to basal metabolism of the albino rat.** T. C. SHERWOOD (J. Nutrition, 1936, 12, 223—236).—Basal metabolism in adult rats shows seasonal variations, with slightly lower vals. in summer. The decline in heat production measured in cal. per kg. is > when measured in cal. per unit surface area. Heat production is more variable in males than in females. Basal

metabolic rates are substantially the same in young rats in both sexes, show sexual differences during active sexual life, and subsequently approach a common val.

A. G. P.

**Reproduction in cattle. II. Influence of environmental factors.** J. ANDERSON (Empire J. Exp. Agric., 1936, 4, 197—207).—The duration and periodicity of oestrus are unrelated to the composition of pasture, rainfall, or temp., but are probably related to the amount of sunshine.

A. G. P.

**Metabolism of Eskimos in the Canadian eastern Arctic.** I. M. RABINOWITCH and F. C. SMITH [with E. V. BAZIN and M. MOUNTFORD] (J. Nutrition, 1936, 12, 337—356).—In Eskimos the non-protein-N of blood was  $>$  in other races. No glucose or CMe<sub>2</sub> appeared in urine and blood-sugar-time curves indicate difficulty in utilisation of carbohydrates. Fat metabolism probably differs from that of other races. Basal metabolic rates are high. Urines contain much Mg but no Pb. Urinary Cu in flesh-eating tribes is  $>$  in those using a mixed diet.

A. G. P.

**Physiology of severe muscular work.** O. BANG, O. BØJE, and M. NIELSEN [with E. H. CHRISTENSEN, A. KROGH, and J. LINDHARD] (Skand. Arch. Physiol., 1936, 74, Suppl. 10, Pt. 1, 208 pp.).—In trained subjects, during 1 hr. work, the blood-sugar (I) remains steady or rises slightly. Immediately after work (I) rises for some min. and then falls to  $>$  resting level. In untrained subjects such work causes a fall in (I). Sufficiently prolonged moderate work causes hypoglycaemia and, at a level of 60 mg. per 100 ml., typical symptoms appear which hinder further work. If glucose (II) be then given, capacity for work is restored, though the R.Q. gives no indication of (II) utilisation by the muscles. A diet rich in carbohydrate given for several days before the experiment delays the onset of the hypoglycaemia caused by work but a diet of fat diminishes the capacity for work. (I) of the venous blood from the working muscles is 6—10 mg. per 100 ml.  $<$  that of the arterial blood. The fermentable (I) may fall to 15 mg. per 100 ml. as the result of hard work. There is no relationship between (I) changes and the alkali reserve, the Et<sub>2</sub>O-sol. acids of the blood, or the body temp.

Moderately severe work causes an initial rise in blood-lactate (III), which reaches a max. in 5 min., and then falls steadily to, or below, the basal level. Training diminishes the initial rise. Since this occurs with work of short duration, the rise is probably due solely to the anaerobic conditions which obtain during the initial stages of muscular activity. When the steady state is reached, phosphagen resynthesis is accomplished by oxidative processes and no lactic acid is then produced.

Increased ventilation is accompanied by lowered alveolar CO<sub>2</sub> tension, lowered [H<sup>+</sup>] of the blood, and little change in (III). The increased ventilation of slight and moderate work is unaccompanied by much change in alveolar CO<sub>2</sub> or blood-[H<sup>+</sup>], and, in max. work with its even greater ventilation, the alveolar CO<sub>2</sub> and [H<sup>+</sup>] may be  $<$  in light or moderate work. Increasing the O<sub>2</sub> tension of the inspired air diminishes

ventilation in spite of a rise in alveolar CO<sub>2</sub> and [H<sup>+</sup>]. Hence changes in lung ventilation are due to changes in the excitability of the respiratory centre to CO<sub>2</sub> and not to changes in alveolar CO<sub>2</sub> tension or [H<sup>+</sup>]. Experimental determination of the excitability of the respiratory centre during muscular work, prolonged O<sub>2</sub> lack, and prolonged NH<sub>4</sub>Cl acidosis shows that the increased ventilation is a measure of the increased excitability. A defined change in blood-[H<sup>+</sup>], produced by breathing CO<sub>2</sub>, causes a much greater increase in ventilation than the same [H<sup>+</sup>] change produced by acidosis.

Nutr. Abs. (m)

**Chemical and energy metabolism during development of insects. II. Ratio of heat production to respiratory processes during postembryonic development (*Lymanthria dispar*, L., and *Bombyx mori*, L.).** N. BALSAM (Acta Biol. Exp., 1933, 8, 59—72).—During growth of the caterpillars there is high evolution of heat with low respiration, the latter decreasing further during moulting. Heat evolution of pupae is half that of larvae.

Ch. Abs. (p)

**Specific dynamic action of glycine intravenously administered to nephrectomised dogs.** A. G. EATON, S. C. CORDILL, and J. L. GOVAUX (J. Nutrition, 1936, 12, 113—120).—The sp. dynamic action of glycine, expressed as cal. per millimol. deaminised, is the same in anaesthetised (Na amytal) and in unanaesthetised dogs, and is independent of the size of the dog. The kidney is not responsible for any appreciable amount of the sp. action.

A. G. P.

**Metabolism of the isolated heart of dogs related to age.** A. E. COHN and J. M. STEELE (J. Clin. Invest., 1935, 14, 915—922).—In heart-lung preps. O<sub>2</sub> consumption decreased with age.

Ch. Abs. (p)

**Changes in gaseous metabolism with age in the sciatic nerve of the rat.** S. N. KAGANOVSKAJA and J. L. KAHN (Biochimia, 1937, 2, 494—498).—The respiration of the nerve increases during the first 2 days after birth but subsequently decreases, the O<sub>2</sub> consumption falling until the 45th day, and remaining const. until the 60th day. The mean val. of the R.Q. is about 0.75 during the first month and about 0.8 during the second.

W. McC.

**Effects of low oxygen pressures on frog cardiac tissue.** A. J. CLARK and G. KINGISEPP (Quart. J. Exp. Physiol., 1935, 25, 279—289).—Activity in the normal and CH<sub>3</sub>I-CO<sub>2</sub>H-poisoned sinus is maintained by an O<sub>2</sub> pressure of 20 mm. Hg. Warburg's formula does not hold for low pressures. Effects of asphyxia on the functions of the heart can be correlated with differences in metabolic rates.

Ch. Abs. (p)

**Respiration curve of isolated frog muscle.** V. A. BELITZER, M. A. ZJUKOVA, and A. J. FALK (Biochimia, 1937, 2, 28—37).—The high O<sub>2</sub> intake of freshly isolated muscle is associated with synthesis of phosphagen.

R. T.

**Aerobic cycle of chemical transformations in muscle.** V. A. BELITZER, M. A. ZJUKOVA, and A. J. FALK (Biochimia, 1937, 2, 38—46).—The O<sub>2</sub> intake of

resting frog muscle is inversely  $\propto$  its phosphagen (I) content. Resting metabolism consists in combustion of lactic acid or other metabolites, the energy thus produced serving for resynthesis of (I), and the intensity of the latter process  $\propto$  content of degradation products of (I). The metabolism thus differs from that of working muscle in not involving glycolytic processes. R. T.

**Distribution of flavin in the tissues of mammals in relation to their residual respiration in presence of cyanides.** A. GOURÉVITCH (Compt. rend., 1937, 204, 526—528).—The flavin (I) content of various organs of the rat and of Jensen sarcoma runs parallel with the residual uptake of  $O_2$  following poisoning of the tissue by  $CN'$ . On the assumption that the residual  $O_2$  uptake is entirely dependent on the (I) system, one mol. of (I) transports 15—44 mols. of  $O_2$  per min. W. O. K.

**Recent advances in nutrition.** E. V. MCCOLLUM (Pennsylvania Med. J., 1935, 39, 61—65).—The significance of vitamins, inorg. constituents, and  $NH_2$ -acids in nutrition is discussed. Pellagra is associated with deficiency in dietary flavin, which is indispensable and is not the antidermatitis factor  $B_2$ . CH. ABS. (p)

(A) Blood and tissues in nutritional muscular dystrophy. (B) Metabolism in nutritional muscular dystrophy. S. MORGULIS and H. C. SPENCER (J. Nutrition, 1937, 12, 172—190, 191—204).—(A) Differences in sugar-tolerance curves of rabbits and man suffering from muscular dystrophy are established. In the fasting blood of diseased rabbits sugar, lactic acid, total acid-sol. P, and the partition of its fractions were unchanged, but lipin-P and cholesterol were  $>$  normal and returned to normal during recovery. In skeletal muscle the concn. of glycogen and the abs. amount of acid-sol. P were  $<$  normal although the P partition was not greatly altered. Creatine diminished in diseased muscle but the % esterified as phosphogen increased. Cholesterol increased in skeletal muscle, diminished in liver, lung, and spleen, and was unchanged in heart, stomach, intestine, brain, and kidney.

(B) Changes in body-wt., in various urinary constituents, and in the N balance during the onset, crit. and progressive stages of dystrophy and during recovery are recorded. A. G. P.

**Nourishment and excretion of the suckling.** Y. FURUHASHI (Japan. J. Med. Sci., 1937, II, 3, 239).—Data are given for the composition of the mother's milk and for the body-wt., growth, and urinary constituents of a child during the first 35 weeks of life. F. O. H.

**Nutritional aspects of milk pasteurisation.** E. V. MCCOLLUM (Publ. Health News, N.J. Dept. Health, 1935, 19, 387—389).—Raw milk has not been proved superior to pasteurised milk in infant feeding. It is less easily digested. CH. ABS. (p)

**Effect of increasing the base excess of a ration on the acid-base equilibrium, health, and yield of milch cows.** E. BROUWER (Bied. Zentr. [Tierernähr], 1935, B, 7, 463—495).—Addition to the ration of a basic supplement (containing  $CO_3''$ ,  $HCO_3'$ ,

$PO_4'''$ , Na, K, Ca, and Mg in the same ratio as in the original ration) increased the  $CO_3''$  but decreased the org. acid contents of the urine. Total  $CO_3''$  in blood plasma was only slightly increased and the general health, yield and composition of milk were unaffected. A. G. P.

**Effects of various levels of lucerne meal on the development of body organs of cockerels.** F. R. SAMPSON and F. E. MUSSEHL (Poultry Sci., 1936, 15, 304—306).—Of the sections of the digestive tract only the small intestine was affected (lengthened) by feeding high levels of lucerne meal. A. G. P.

**Activity of yeast extract in the prevention of renal hypertrophy caused by high-protein diets.** B. B. LONGWELL, R. P. JOHNSTON, and R. M. HILL (J. Nutrition, 1936, 12, 155—164; cf. A., 1933, 433).—Young rats receiving dietary cystine  $>$  the amount necessary for optimum growth developed renal hypertrophy. Supplementary feeding of yeast extracts had a corrective action. Neither tikitiki extract nor autoclaved liver entirely prevented the hypertrophy but had an inhibitory action when given together. A. G. P.

**Supplemental value of peanuts to the laying ration [of hens].** D. F. KING and G. J. COTTIER (45th Ann. Rep. Alabama Agric. Exp. Sta., 1934, 23—24).—Peanut meal used as sole protein supplement caused deposition of much softer body-fat in hens than did skim milk. Addition of skim milk to the peanut ration in amounts to provide 50% of the supplementary protein increased body wt. and improved the yield, size, and quality of eggs. CH. ABS. (p)

**Effect of supplementing the diet with different forms of sulphur on the wool of merino sheep.** C. M. VAN WIJKE, M. L. BOTHA, and J. G. BEKKER (Onderstepoort J. Vet. Sci., 1935, 5, 177—178).—Prolonged daily administration of cystine, sulphates, KCNS, or S had no effect on the wool. CH. ABS. (p)

**Effect of overfeeding on protein metabolism of man.** I. Effect of superimposing raw and boiled milks on an adequate diet II. Superimposition of beef (or soya flour) + lactose + butter, equivalent to a litre of milk, on an adequate diet. D. P. CUTHBERTSON, A. MCCUTCHEON, and H. N. MUNRO. III. Protein-saving effect of carbohydrate and fat superimposed on an adequate diet. D. P. CUTHBERTSON and H. N. MUNRO (Biochem. J., 1937, 31, 681—693, 694—705).—I, II. Addition of 1 litre of milk per day to a diet adequate for maintenance in adolescents or adults causes retention of S (53%) and N (54%), whether the milk is raw or boiled. Considerable N retention also occurs when an equiv. amount of beef (or soya flour) + lactose + butter is superimposed, and this is evenly eliminated on discontinuance of overfeeding.

III. Carbohydrate has a greater N- and S-saving effect than fat. Addition of glucose equiv. in calorific val. to 54% of that of the basal diet reduces the N and S output by about 35%. P. G. M.

**Nutrition of tissue cells.** A. FISCHER (Hospitalstidende, 1936, 79, 841—853).—Heparin (I) is a

carbohydrate-glycuronic acid compound which unites with proteins stable near or on the acid side of their isoelectric points. Thus it prevents coagulation, since it combines with the coagulant (thrombokinase, thrombin) and prevents the chain reaction between the coagulant and the plasma-protein, with denaturation, to form a coagulum. (I) inhibits cellular growth in the same way by combining with the growth-promoting substances, *e.g.*, of embryonic tissue extracts. Intact cell surfaces have strong coagulating power and fix large protein mols. In tissue cultures, growth-promoting substances are associated with such mols. Denaturation accompanies fixation and the proteins are then subject to enzymic action. Such contact digestion, which is of great importance in lower animals, occurs in the digestive tract of the dog. The process is not necessarily the same as phagocytosis. The presence of the cell surface is essential; fixation of proteins to it is followed by dissolution of surface membrane and of proteins. The mols. of which cell surfaces are built have a definite chemical orientation. They are chiefly protein and lipid in nature and so arranged that there is a large no. of free  $\text{CO}_2\text{H}$  and  $\text{NH}_2$  groups at the outside. When the acid groups of circulating proteins are bound, denaturation occurs with liberation of  $\text{H}_2\text{O}$ -sol. groups and decrease in solubility. The resulting product has a definite structure dependent on the nature of the cell surface and is probably cryst.

NUTR. ABS. (m)

**Protein digestion of wood-boring insects.** H. S. HOFF (Nature, 1937, 139, 286—287).—N contents of the frass of wood-boring insects and of the wood on which they feed are compared. L. S. T.

**Change in the concentration of ovoglobulin in egg white during egg formation.** J. S. HUGHES and H. M. SCOTT (Poultry Sci., 1936, 15, 349—351).—The % of ovoglobulin (I) in the inner and outer layers of egg white is greater in laid than in uterine eggs, the difference being more marked in inner layers. (I) probably does not pass into the egg through the shell membranes. The apparent increase in the proportion of (I) pptd. by 1.5% aq.  $\text{Na}_2\text{SO}_4$  is accompanied by increased  $\eta$  in the white and results from changes in the solubility of egg-proteins after deposition. A. G. P.

**Nitrogen and creatine metabolism in relation to environmental temperature and thyroid function.** M. BODANSKY and V. B. DUFF (Endocrinol., 1936, 20, 822—830).—Exposure of normal rats to cold causes a rise in excretion of N, creatine (I), and guanidinoacetic acid; the increases in endogenous and total protein metabolism seem to be related to thyroid activity. Thyroxine (II) or exposure to cold causes abnormal fluctuations in total creatinine excretion, which may represent an unsteady state of endogenous metabolism. The adrenals and thyroid are probably interrelated in the control of N and (I) metabolism; the depressions of the latter at high temp. are only moderately augmented by (II).

R. N. C.

**Amino-acid clearance.** E. KIRK (Acta med. scand., 1936, 89, 450—453).—The  $\text{NH}_2$ -acid clearance increases considerably with increasing concn. of  $\text{NH}_2$ -

acid in the plasma. The concn. of urinary  $\text{NH}_2$ -N when the urine vols. are large may be < the concn. in the plasma, indicating tubular re-absorption of  $\text{NH}_2$ -acids.

NUTR. ABS. (m)

**Amino-acid and ammonia metabolism in liver diseases.** E. KIRK (Acta med. scand., 1936, 89, Suppl. 77, 147 pp.).—There is no essential difference in deaminative power between healthy persons and persons with liver disease. In cirrhosis of the liver blood- $\text{NH}_3$  vals. are abnormally high. This is due not to impaired urea synthesis but possibly to a collateral portal circulation avoiding the liver.

NUTR. ABS. (m)

**Production of amino-acids by intermolecular transfer of amino-groups. I. Metabolism of  $\ell$ (+)-glutamic acid in muscle.** A. E. BRAUNSCHEIN and M. G. KRITZMAN (Biochimia, 1937, 2, 242—262).—In minced muscle under aerobic conditions  $\text{NH}_2$  from  $\ell$ (+)-glutamic acid (I) reacts with  $\text{AcCO}_2\text{H}$  arising from oxidation of lactic acid (II) giving alanine (III).  $\text{AcCO}_2\text{H}$  added or produced by glycolysis reacts similarly. The breakdown of (I) is not accompanied by change in the  $\text{NH}_3$ ,  $\text{NH}_2$ -N, or total N contents of the muscle. The (I) content of minced pigeon muscle at  $37^\circ$ , under anaerobic conditions and in presence of  $\text{CH}_2\text{BrCO}_2\text{H}$  decreases by 10—20% in 3 hr., succinic acid (IV) in approx. theoretical yield being produced. The (II) content remains unchanged. Under aerobic conditions there is a 40—60% decrease in the (I) content, small amounts only of (IV) accumulate, an equiv. of (II) disappears, and an equiv. of (III) is produced. Anaerobic breakdown of (I) is increased to 40—60% by addition of  $\text{AcCO}_2\text{H}$ . Probably the transfer of the  $\text{NH}_2$  of (I) occurs in tissues other than muscle,  $\alpha$ -keto-acids other than  $\text{AcCO}_2\text{H}$  also acting as acceptors. Aspartic acid and possibly other  $\text{NH}_2$ -acids also act as  $\text{NH}_2$ -donators. W. McC.

**Biochemical changes in the fatigued organism. Effect of muscular exercise on the amino- and residual nitrogen contents of the blood.** J. M. HEFTER and V. M. KIRJAN (Biochimia, 1937, 2, 499—505).—In untrained rabbits, exercise for 5 min. increases the  $\text{NH}_2$ -N and residual N contents of the blood. The corresponding changes for trained rabbits are smaller and those for rabbits exercised to complete exhaustion are greater. In man intense exercise of short duration causes no appreciable increase in the vals. W. McC.

**Formation of histamine in the organism.** P. HOLZ and R. HEISE (Naturwiss., 1937, 25, 201).—A substance (probably histamine) which lowers the blood pressure of cats is formed on incubation for 12—24 hr. under PhMe at  $37^\circ$  of guinea-pig's liver or kidney with histidine. Kidney is 4—6 times more active than liver, whilst skeletal muscle, spleen, and pancreas are without such activity. P. W. C.

**Effect of creatine on muscle respiration.** V. A. BELITZER (Biochimia, 1937, 2, 332—343).—Creatine added to sliced frog muscle (0.4—0.8 g. per 100 g.) acts as a  $\text{PO}_4'''$  acceptor, doubling the intensity of respiration in 30 min. At the same time the phosphagen (I) content of the muscle increases.

Addition of  $\text{CH}_3\text{Br}\cdot\text{CO}_2\text{H}$  (1 : 20,000) does not prevent these changes, but under anaerobic conditions the extent of (I) synthesis is very greatly diminished. Added creatinine and phosphocreatine do not increase the respiration. W. McC.

**Biochemistry of excretion of indole and of production of indican.** F. BOHM [with G. GRUNER and E. BOHM] (Biochem. Z., 1937, 290, 137—171).—Indole (I) administered to man and animals in amounts  $\gg$  a certain limiting dose (varying with the species of animal) is quantitatively excreted as urinary indican (II). (I) above the limit is excreted in the urine partly as a non-volatile substance (5 : 6-dihydroxyindole?). With few exceptions (e.g., indoxyl, indolealdehyde) only those derivatives of (I) having positions 2 and 3 free are converted into (II) in the animal body. *o*-Nitrophenyl (but not *o*-aminophenyl) compounds having an acetylenic side chain (e.g., *o*-nitrophenyl-propionic acid or -acetylene) and *o*-nitroacetophenone are also converted into (II) in the body but these are not first converted into (I). W. McC.

**Krebs' theory of urea production.** E. S. LONDON and A. K. ALEXANDRI (Biochimia, 1937, 2, 304—311).—Experiments on angiotomised dogs do not confirm the theory (A., 1932, 1059). W. McC.

**Metabolism during muscular work. I. Fat metabolism.** A. CHARIT and A. SCHRETTER (J. Physiol. U.S.S.R., 1935, 19, 540—548).—During work the fat content of arterial blood diminishes by an average of 15—16% compared with that during rest. Fat is required not by muscles but by other organs during work. CH. ABS. (p)

**Effect of unsaturated linkings and free alcoholic groups on pancreatic digestion of glycerides of higher fatty acids.** G. PERETTI (Arch. Fisiol., 1936, 36, 113—120; cf. A., 1936, 1018).—The rate of hydrolysis *in vitro* by pancreatic lipase of various unsaturated fats was independent of their degree of unsaturation. The rate for olein was  $<$  that for diolein, which was hydrolysed more slowly than were the fats. Hence the free alcoholic group probably inhibits the action of the enzyme. NUTR. ABS. (m)

**Mechanism of absorption of fats and lipins.** C. JIMENEZ DIAZ, F. BIELSCHOWSKY, and H. J. CASTRO MENDOZA (Ann. Méd., 1936, 39, 449—460).—In a case of spontaneous chyluria, after large doses of cod-liver oil, only traces appeared in the urine during the first 3 hr., the max. absorption and excretion occurring at 4—7 hr. Frequently high fat content of the urine was accompanied by low blood-fat and *vice versa*, a nervous mechanism being postulated to explain the phenomenon. In blood the cholesterol (I) vals. fluctuated in the same manner as the total fat vals. but in urine the ratio (I) : total fat was 1 : 8.8—1 : 33. Since similar variations occur in lymph the chyluria was possibly due to the communication of urinary and lymphatic channels. The ratio (I) : cholesterol ester was 52.4—63% in urine and 60—74.5% in blood. (I) apparently traverses the intestinal wall in a form resembling that in blood, esterification being effected without direct action of the hepatic cell. NUTR. ABS. (m)

**Biochemistry of *Leptinotarsa decemlineata*, Say, during hibernation.** R. G. BUSNEL and A. DEILHON (Compt. rend. Soc. Biol., 1937, 124, 916—917).—A marked increase in the lipins was observed preceding hibernation, there being a very gradual decrease during the period of hibernation followed by a rapid decrease during the return to normal.

H. G. R.

**Cholesterol metabolism in children with and without endocrine dysfunctions.** M. MOLITSCH and S. POLJAKOV (Arch. Pediat., 1936, 53, 613—616).—The total cholesterol (I) content of the serum of normal boys was 81—204 mg. per 100 ml. In 85% of these boys the val. was 100—160 mg., whilst the average for normal boys and boys with endocrine dysfunctions was 130.7 mg. No correlation was found between (I), basal metabolism, and mental level. The fat content of the diet affected the (I) level. NUTR. ABS. (m)

**Experimental production of cholesterosis of the gall bladder : cholesterol absorptive properties of the gall bladder wall.** L. M. ROUSSELOT and L. BAUMAN (Surg. Gynecol. Obstet., 1935, 61, 585—590).—Solutions of cholesterol (I) in aq. bile salts placed in the gall bladder of dogs were absorbed. No change occurred in the (I) content of the bladder wall. CH. ABS. (p)

**Spectroscopic investigation of permeability. Application in hyperthyroidism.** J. FROMAN (Biochem. Z., 1937, 290, 241—247).—Methemoglobin (I) is injected into the abdominal cavity of rabbits and the course of absorption of (I) is then followed by spectrophotometric determination of (I) in the blood. In hyperthyroidism the rate of absorption is high. W. McC.

**Vital staining of bones with madder.** D. RICHTER (Biochem. J., 1937, 31, 591—595).—When pure specimens of alizarin, ruberythric acid, purpurin, and purpurin-3-carboxylic acid (I) were fed to young rats and pigeons, only (I) gave carmine-stained bones typical of madder-staining. Feeding (I) glucoside (galiosin) had the same effect. The colouring matter of madder-stained bones is extracted, after digestion with HCl, with PhMe and identified spectroscopically as (I) by absorption bands at 565, 532 and 495 m $\mu$ . P. W. C.

**Phenolphthalein studies.** B. FANTUS and J. M. DYNIEWICZ (J. Amer. Med. Assoc., 1937, 108, 439—443).—Phenolphthalein (I) is excreted in both free and combined forms. The latter, always present in greater amount than the former, can be hydrolysed by prolonged heating with acid. (I) does not cause albuminuria in medicinal doses. P. G. M.

***p*-Aminobenzenesulphonamide. Absorption, excretion, and determination in blood and urine.** E. K. MARSHALL, jun., K. EMERSON, jun., and W. C. CUTTING (J. Amer. Med. Assoc., 1937, 108, 953—957).—*p*- $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  (I) is excreted in both free and combined forms. Total (I) can be determined after hydrolysis with dil. HCl by a method based on the formation of an azo-dye on coupling diazotised (I) in acid solution with  $\alpha\text{-C}_{10}\text{H}_9\cdot\text{NMe}_2$ . In dogs (I) is excreted only in the free form. (I) is

also present in the cerebrospinal fluid in concn. similar to that in blood after oral administration.

P. G. M.

**Acetylation of *p*-aminobenzenesulphonamide in the animal organism.** E. K. MARSHALL, jun., W. C. CUTTING, and K. EMERSON, jun. (Science, 1937, 85, 202—203).—In man and in the rabbit, but not in the dog, the conjugated compound found in the urine after oral administration of  $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  is mainly the Ac derivative.

L. S. T.

**Carbohydrate metabolism of the frog. I. Blood-sugar of the frog in summer. II. Glycogen in the liver of the frog in summer.** H. S. LEE (J. Chosen Med. Assoc., 1936, 26, 24, 24—25).—I. The blood-sugar level of the frog in summer was 14—43 mg. per 100 ml. and was not changed by injection of adrenaline (I) or insulin or by exposure to heat or cold or by forced movement.

II. The liver of the frog in summer contained 0.663—0.849% of glycogen; this val. was lowered by administration of (I) and strychnine but to a smaller extent than in warm-blooded animals. It was increased on exposure to cold.

NUTR. ABS. (m)

**Metabolism of glycerol and hepatic function.** J. A. LEDERER (Rev. belge Sci. méd., 1936, 8, 373—399).—The glycogen (I) content of liver pulp from healthy dogs and rabbits and from dogs poisoned with P is greatly increased *in vitro* by addition of glycerol (II). Insulin, added at the same time, causes further slight increase. The (I) content of dog's liver is slightly reduced by perfusion with blood containing 1.2% of (II) although the sugar content of the blood is increased and part of the (II) disappears from the blood. The (I) content of the livers of rats, rabbits, and dogs is greatly increased by administration of (II). In healthy and diabetic dogs intravenously injected (II) disappears to the extent of 80% from the blood in 5 min. and the sugar content of the blood is slightly increased. In healthy and Eck fistula dogs and in healthy persons and those suffering from liver disease, ingestion of (II) causes slight increase in blood-sugar. The amount of (II) eliminated in the urine following ingestion of (II) is slightly greater in diseased than in healthy persons. NUTR. ABS. (m)

**Centre of carbohydrate metabolism in the dog deprived of humoral and cerebral sugar regulators.** A. LE GRAND, J. COUSIN, and P. LAMIDON (Compt. rend. Soc. Biol., 1937, 124, 1231—1233).—A transitory hyperglycæmia is observed after local stimulation of the floor of the fourth ventricle in the decerebrate dog with the thyroid, adrenal, pancreatic, and pituitary glands removed. H. G. R.

**Transformation of adenosine triphosphate in invertebrate muscle.** D. FERDMAN, O. FEIN-SCHMIDT, and M. OKUN (Biochimia, 1937, 2, 168—180).—The total  $\text{NH}_4\text{-N}$  and  $\text{NH}_3$  contents of the claw muscle of fresh-water crayfish remain unchanged during work but the adenosine triphosphate (I) content decreases and the adenylic acid (II) content increases. The inorg.  $\text{P}_2\text{O}_7^{4-}$  content of 100 g. of the resting muscle is 0.5—5 mg., whilst that of the fatigued muscle is 5.1—12.3 mg. (I) is synthesised

and the inorg.  $\text{P}_2\text{O}_7^{4-}$  content decreases during recovery. During autolysis (I) is dephosphorylated and (II) (but not inorg.  $\text{P}_2\text{O}_7^{4-}$ ) accumulates. Freezing of the muscle in liquid air causes production of  $\text{NH}_3$  but does not affect the (I) content. W. McC.

**Oxidation coefficient of lactic acid in the animal world.** V. BORSUK (J. Physiol. U.S.S.R., 1935, 19, 549—562).—The decomp. and resynthesis of glycogen in invertebrates is examined.

CH. ABS. (p)

**Enzymic formation of lactic acid in heart muscle.** S. OCHOA (Biochem. Z., 1937, 290, 62—70).—Heart muscle tissue and its extract form lactic acid (I) by the same series of reactions as does skeletal muscle, but the yield of (I) is smaller and the intermediate reactions occur to a smaller extent. The AcCHO mechanism plays no greater role than in ordinary muscle.

P. W. C.

**Lactate and pyruvate in blood and urine after exercise.** R. E. JOHNSON and H. T. EDWARDS (J. Biol. Chem., 1937, 118, 427—432).—The lactic acid (I) and  $\text{AcCO}_2\text{H}$  (II) (isolated as 2:4-dinitrophenylhydrazones) recovery curves for blood and urine in young men after strenuous exercise are similar in shape but (II) is present to a much smaller extent than is (I). This gives support in experiments *in vivo* to the Embden-Meyerhof scheme of muscle glycolysis (A., 1936, 1406).

P. W. C.

**Metabolism of ketonic acids in animal tissues.** H. A. KREBS and W. A. JOHNSON (Biochem. J., 1937, 31, 645—660).— $\text{AcCO}_2\text{H}$  (I) is metabolised by animal tissues to  $\text{AcOH}$ ,  $\text{CO}_2$ , and lactic, succinic, and  $\beta$ -hydroxybutyric acid. Octyl alcohol,  $\text{As}_2\text{O}_3$ , and  $\text{CH}_3\text{I}\cdot\text{CO}_2\text{H}$  inhibit the dismutation of (I), whilst reduced glutathione, insulin, glucose, 0.02M-*dl*-lactate, acetate, fumarate, glutamate, malonate, and tartronate, and  $\text{NH}_4\text{Cl}$  have no effect. Other ketonic acids behave similarly to (I). Ketonic compounds are intermediates in both fat and carbohydrate metabolism.

P. G. M.

**Decomposition of  $\alpha$ -keto-acids in the animal organism.** P. E. SIMOLA and K. PUUTULA (Suomen Kem., 1937, 10, B, 7—8).—Anaerobic  $\text{CO}_2$  evolution from rat brain, kidney, and liver is increased by addition of  $\text{AcCO}_2\text{H}$  and  $\text{CO}_2\text{H}\cdot[\text{CH}_2]_2\cdot\text{CO}\cdot\text{CO}_2\text{H}$ , whilst aerobic brain and kidney show a greatly increased  $\text{O}_2$  uptake. Anaerobic decomp. of the acids is due to carboxylase, and the aerobic to a sp. oxidase system.

M. H. M. A.

**Post-mortem change in liver.** K. MOMONOI (Okayama-Ig.-Zasshi, 1935, 47, 1480—1495).—Residual N, P, and S in rabbit liver increased with time after death (until 40—50 days) at rates which varied with environmental conditions.

CH. ABS. (p)

**Effect of the intake of calcium on the blood-iodine level.** J. THOMPSON (Endocrinol., 1936, 20, 809—815).—Blood-I is decreased in rats by Ca in the diet, dietary I being kept const. Dietary I when high shows no close relation to blood-I, and its variation does not affect serum-Ca. Disturbance of the Ca:I ratio of the diet beyond certain limits causes symptoms resembling goitre in rats on I-poor diets, and

iodism in animals given much I and little Ca. Blood-I is not the determining factor in iodism. R. N. C.

**Nutritional and biochemical effects of a low-calcium diet on sheep.** I. Nutritional. II. Biochemical. III. Analyses of bones. M. C. FRANKLIN (Univ. Cambridge, Inst. Animal Path., Fourth Rep. of Director, 1934—35, 111—178).—Ewes ate approx. 700—800 g. of maize and 150—200 g. of hay daily and lambs about 3100 g. of maize and 1400 g. of hay weekly. The daily CaO intake of the sheep was 1.36—2.75 g. (sheep require 5—7 g. daily). The wt. increase of the lambs was very slow. Sheep adapt themselves very quickly to a mineral-deficient ration and such deficiency does not affect the digestibility of the org. constituents. The ration lowers the blood-Ca, raises the inorg. P and Mg of the blood, and reduces the content of inorg. constituents in the bones. The ratio of diffusible to non-diffusible Ca in the blood is unaltered. NUTR. ABS. (m)

**Bile acids in calcium metabolism.** X. Calcium and potassium contents of the liver of splenectomised rabbits. M. IWADÔ (Arb. med. Fak. Okayama, 1936, 5, 91—95).—After splenectomy the Ca and K contents of the liver of rabbits appear to increase. Individual variations are large. NUTR. ABS. (m)

**Biochemistry of copper.** XIII. Changes in blood-copper during experimental hæmolytic anæmia. XIV. Accumulation of copper in the mongolian spot. S. NARASAKA. XV. Blood-copper and sexual phenomena. U. SARATA. XVI. Copper content of black and white hairs of aged people. H. YOSIKAWA. XVII. Copper and the pigmentation of leaves and flowers. XVIII. Variations in copper content of assimilative and reproductive organs during the development of plants. U. SARATA. XIX. Influence of copper on the oxidation quotient of urine. S. YOSIDA (Japan. J. Med. Sci., 1937, II, 3, 159—162, 175—178, 179—187, 195—196, 197—205, 207—210, 221—226; cf. A., 1936, 239).—XIII. Anæmia induced in rabbits by injection of  $\text{NHPh}\cdot\text{NH}_2$  is accompanied by an increased blood-Cu to an extent approx.  $\propto$  that of the anæmia.

XIV. The mongolian spot of the skin of infants dying at birth is associated with a Cu content  $>$  that of the normally pigmented skin.

XV. The blood-Cu is increased above normal vals. in hens during brooding and in dogs during œstrus and gestation; the distribution of Cu between cells and plasma is unchanged.

XVI. Depigmentation of hair with old age is associated with a diminution of Cu content.

XVII. Data for the distribution of Cu in different parts of various plants are tabulated. With a type of cabbage, the highest Cu content occurs in the young centre leaves whilst the green outer leaves contain  $<$  the white inner leaves. A relationship appears to exist between Cu content and pigmentation of leaves and flowers, but the differences in distribution of Cu in chlorotic and variegated plants are not regular.

XVIII. Data for the Cu content of different parts of *Pæonia moutan* during growth and maturity indicate considerable fluctuations during the growth of

the fruit and that Cu plays an important role in the reproductive processes.

XIX. The oxidation quotient (Muller, A., 1927, 996) of the urine of rabbits is not affected by intravenous injection of 0.2 mg. of Cu (as aq.  $\text{CuSO}_4$ ) per kg. The quotient increases after feeding. F. O. H.

**Assimilation of iron in the course of embryonic development of chicken.** A. SZEJNMAN-ROZENBERG (Acta. Biol. exp., 1933, 8, 32—44).—The daily abs. increase in Fe assimilation of the whole chick embryo shows max. on the 12th and 18th days and a min. in 15—16 days, at which Fe imbibition is completely inhibited. This inhibition coincides with intensive increase in dry matter and albuminoids. The ratio of Fe in body : Fe in membrane shifts continuously in favour of the body. The % of Fe in liver is approx. the same as that in the whole embryo. Approx. 96% of the Fe in the egg is assimilated during hatching. CH. ABS. (p)

**Iron metabolism and hæmatopoiesis in the dog after total gastrectomy.** G. FONTES, J. KUNLIN, and L. THIVOLLE (Sang, 1936, No. 4, 433—445).—After gastrectomy there is an immediate decrease in wt. and in the hæmoglobin (I) and erythrocyte content of the blood, then rapid recovery of all three without reaching initial levels (this stage lasts approx. 6 months), and finally gradual decrease of wt. and blood indices, (I) content decreasing more rapidly than erythrocyte content so that a progressive hypochromic anæmia develops. At death, at 11—14 months, there is no Fe reserve in liver or spleen. Addisin, if it exists, is not necessary for blood formation. It is the absence of gastric HCl which, through failure of ionisation of Fe, leads to secondary hypochromic, not to pernicious, anæmia. Achylia causes hypochromic, but cannot explain the occurrence of pernicious, anæmia. NUTR. ABS. (m)

**Significance of chlorides in tissues and animals** L. IRVING and J. F. MANERY (Biol. Rev., 1936, 11, 287—310).—All or almost all the Cl of animal tissue is ionisable chlorides, chiefly of Na and K. The animal organism contains no appreciable reserves of  $\text{Cl}'$  and  $\text{Cl}'$  depletion rapidly leads to serious disorders which can often be checked by administration of NaCl. During embryonic development the  $\text{Cl}'$  concn. of the tissues decreases, but that of bases probably remains const., the loss of  $\text{Cl}'$  being balanced by production of new  $\text{HCO}_3'$ ,  $\text{PO}_4'''$ , and protein. Decrease in  $\text{Cl}'$  concn. accompanies specialisation of function, the concn. in adult tissues and fluids being inversely  $\propto$  their degree of specialisation. Theories of membrane equilibria do not explain the loss of  $\text{Cl}'$  during growth.  $\text{Cl}'$  does not participate in oxidative reactions but acts as a relatively inert complement to other anions. The  $\text{Cl}'$  concn. in tissues and fluids is a useful initial indicator of the electrolyte composition of a system or of change in this composition. Tables showing the  $\text{Cl}'$ , total base, and  $\text{H}_2\text{O}$  content of tissues and fluids, the electrolyte composition of tissues, and the changes in  $\text{Cl}'$  content during early development are given, and two figures show the anionic composition of tissues, fluids, and developing eggs. NUTR. ABS. (m)

Phosphorus in the early development of the frog. M. A. ZIELIŃSKI (Acta Biol. exp., 1935, 9, 131—144).—The inorg.  $\text{PO}_4'''$  content of 100 unfertilised frogs' eggs was 0.004 mg. For the first 60—80 hr. after fertilisation this increased at the expense of the labile P, while the total acid-sol. P remained const. After this time, which coincided with the commencement of increased activity of the tadpole, all the P fractions increased.

NUTR. ABS. (m)

Phosphorus deficiency metabolism and food utilisation in beef heifers. M. KLEIBER, H. GOSS, and H. R. GUILBERT (J. Nutrition, 1936, 12, 121—153).—P deficiency had no influence on body-temp., digestibility and availability of food energy, R.Q., or fasting metabolism but decreased the partial efficiency of energy utilisation and the efficiency of food protein in sparing body-protein. The total efficiency of energy utilisation was decreased mainly by lowering the appetite and also by decreasing the partial efficiency but without influencing fasting catabolism.

A. G. P.

Rôle of phosphate in the anaerobic metabolism of muscle. J. WAJZER and R. LIPPMANN (Compt. rend. Soc. Biol., 1937, 124, 1090—1091).—The rôle of  $\text{PO}_4'''$  is antagonistic to that of  $\text{K}^+$ . H. G. R.

Use of isotopes as indicators in biological research. A. KROGH (Science, 1937, 85, 187—191).—An address. L. S. T.

Exchange of hydrogen between the free water and the organic substances in the living organism. A. KROGH and H. H. USSING (Skand. Arch. Physiol., 1936, 75, 90—104).—The exchange of H for D in ovalbumin *in vitro* and in sprouting peas, frogs, rats, and mice was studied by supplying  $\text{D}_2\text{O}$  and determining the ratio of  $\text{D}_2\text{O}$  in the water formed by combustion of the dry tissue to that in the free  $\text{H}_2\text{O}$  of the fresh tissue. In all cases the  $[\text{D}_2\text{O}]$  of the free water was the same in all tissues. In most tissues equilibrium was attained in a few days and was maintained for a long time in tissues kept cold. In the living organism a change in  $[\text{D}_2\text{O}]$  was fairly rapidly followed by establishment of the new equilibrium except in the muscles, where absorption of  $\text{D}_2\text{O}$  proceeded slowly. The rate was increased in muscles by muscular activity. Possibly the muscle proteins take part in the mechanism of contraction, one or a few at. groups reacting in such a way that exchange can occur. Subsequent internal changes in the protein mol. then permit repetition of the exchange. In the animal body little or no exchange occurs in the fats and hence it is in the proteins that the process chiefly occurs.

NUTR. ABS. (m)

Supersonics in chemistry [biological effects].—See A., I, 319.

Phosphatide auto-complex conservates as ionic systems and their relation to the protoplasmic membrane. II.—See A., I, 301.

Biological effect of centimetre waves. S. J. TURLIGUIN (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 433—436).—The oscillations of a generator of frequency  $1.5 \times 10^{10}$  cycles ( $\lambda = 2$  cm.) accelerated the growth of asters by 20—45%: P. W. C.

Biological action of radiation from radioactive substances. II. Effect of  $\beta$ - and  $\gamma$ -radiation from monazite sand and samarskite on the rate of growth and the œstrus cycle of mice. Y. KIMURA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, 31, 229—243; cf. A., 1935, 1539).—Growth is retarded by the  $\beta$ - and  $\gamma$ -radiations from monazite sand, but not by those from samarskite. There is no effect on the œstrus cycle. J. L. D.

Influence of ultra-violet irradiation on frog and *Limulus* hearts subjected to potassium excess. S. A. GUTTMAN (J. Cell. Comp. Physiol., 1936, 8, 37—40).—Hearts which had stopped beating through application of excess of K could be started again by ultra-violet irradiation; those stopped by excess of Ca could not. Possibly the ultra-violet light causes a change in permeability and a shift in the K—Ca equilibrium. M. A. B.

Effect of potassium on cold blocking of spider crab nerve. H. N. ETS (J. Cell. Comp. Physiol., 1936, 8, 101—108).—Immersion of the nerve in NaCl—KCl—CaCl<sub>2</sub> solution containing 0.066% of KCl (normal solution) lowered the temp. of blocking, the extent of lowering depending on time of immersion. For a given time of immersion, blocking temp. was higher with a higher [KCl]. With 0.310% KCl loss of irritability occurred; this effect could be reversed by placing in the normal solution again. M. A. B.

Variation in the concentration of potassium and calcium ions in cholinergic and adrenergic perfusates obtained by stimulation of the vago-sympathetic trunk. N. GAVRILESCU and N. IONESCU (Compt. rend. Soc. Biol., 1937, 124, 971—972).— $[\text{K}^+]$  is increased by vago-sympathetic stimulation, the increase being greater in the cholinergic perfusate. H. G. R.

Effect of sodium chloride on the imbibition of natural organic colloids in solutions of non-electrolytes. D. KOHLER (Compt. rend. Soc. Biol., 1937, 124, 1086—1088).—The coeff. of imbibition of *Laminaria* in a mixture of NaCl and non-electrolyte is < the calc. val. or the val. for the separate constituents. On varying the ratio of the constituents, a min. val. for the coeff. is obtained. H. G. R.

Detection of gold in brain and fetuses of animals injected with Sanocrysin. W. J. ROBERTS (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 207—216; cf. A., 1935, 1290).—The distribution of Au in treated rabbits, rats, and mice is examined. The transport of Au in the body is discussed.

A. G. P.

Effects of a high manganese content in the diet of animals with special reference to lactation tetany. F. BLAKEMORE, J. A. NICHOLSON, and J. STEWART (Vet. Rec., 1937, 49, 415—422).—Pasture grasses associated with outbreaks of lactation tetany contained abnormally large proportions of Mn. Oral administration of sub-lethal doses of Mn decreased blood-Mg and increased blood-Mn. Repeated treatment with Mn did not depress blood-Mg indefinitely. A. G. P.

Mercury inunctions. T. SOLLMAN, H. N. COLE, and N. F. SCHREIBLER (Arch. Dermatol. Syphilol.,

1935, 32, 242—257).—Metallic Hg in 50% ointments was the most effective. Hg oleate was as well absorbed. Colloidal Hg was not absorbed. Urinary excretion of Hg<sup>+</sup> was greater in whites than in negroes.

CH. ABS. (p)

**Influence of metallic compounds on growth and histological picture of fibroblast cultivated *in vitro*.** Y. NAKAZAWA (*Folia Pharmacol. Japon.*, 1935, 21, 49—69).—Small concns. of NiCl<sub>2</sub>, CoCl<sub>2</sub>, MnSO<sub>4</sub>, alum, and Na<sub>2</sub>WO<sub>4</sub> increase, and larger concns. decrease, the growth of fibroblast. K<sub>2</sub>CrO<sub>4</sub> is inhibitory at all concns.

CH. ABS. (p)

**Effect of asphyxia on the sinus and conducting tissue of the frog heart.** G. KINGSEPP (*Quart. J. Exp. Physiol.*, 1935, 291—302).—Differences in the effects of asphyxia in normal and CH<sub>2</sub>I·CO<sub>2</sub>H-poisoned hearts are attributable to the production of lactic acid in the former but not in the latter case.

CH. ABS. (p)

**Effect of organic ions on the membrane potential of nerves.** W. WILBRANDT (*J. Gen. Physiol.*, 1937, 20, 519—541).—Increased osmotic pressure raises, and decreased osmotic pressure lowers, the resting potential of frog's sciatic nerve in accordance with the assumption of a membrane potential. Both cations and anions have a definite effect on this potential. The efficacy of org. cations ranges between that of Na and K, that of both org. and inorg. anions being much weaker. The effect of anions shows that the nerve membrane is not completely permeable to anions whilst it is highly permeable to cations.

E. A. H. R.

**Influence of certain hydrotropic and other substances on fat absorption.** M. H. IRWIN, J. WEBER, and H. STEENBOCK (*J. Nutrition*, 1936, 12, 365—371).—Ingestion of considerable amounts of H<sub>2</sub>O, bile salts, NaOBz, EtOH, peptone, sucrose, KCl, CaCl<sub>2</sub>, NaH<sub>2</sub>PO<sub>4</sub>, glycerol, or Na glycerophosphate decreases the rate of fat absorption by rats. Small amounts had little effect.

A. G. P.

**Hypoglycaemic action of pyruvic acid.** S. KAMIYA (*Japan. J. Med. Sci.*, 1937, II, 3, 171—173).—Small doses (0.1—2.6 g.) of AcCO<sub>2</sub>H, intravenously injected, lower the blood-sugar in rabbits.

F. O. H.

**Action of "βγ-hexenol," a constituent of raw leaves of *Thea sinensis japonica*; comparison with hexyl alcohol. I. General toxic manifestation: action on cold- and warm-blooded animals.** S. MURAKAMI (*Folia Pharmacol. Japon.*, 1935, 21, 131—140).—Intravenous administration of "βγ-hexenol" as an emulsion in gum acacia decreases respiration and voluntary movements. Its action resembles that of hexyl alcohol.

CH. ABS. (p)

**Effects on the rabbit of repeated large intravenous doses of glucose.** H. E. HARDING (*Guy's Hosp. Rep.*, 1935, 85, 372—376).—Repeated heavy injections of glucose (I) produced severe loss in wt. of rabbits due to dehydration of the tissues. This was prevented by oral administration of dil. saline solution. Changes in blood-sugar following the injections are recorded; of the injected (I) 80—90% was retained.

CH. ABS. (p)

**Relationship between cholesterol and vascular sclerosis.** S. ZURUKZOGU and O. MUNDEL (*Z. Vitaminforsch.*, 1937, 6, 125—129).—Inunction of rabbits with cholesterol-vaseline-turpentine ointment produces slight thickening of the intima and fat deposition in the intima and interna elastica of the aorta, whilst that with lanolin produces calcification of the aorta. The effects are accentuated by ultra-violet irradiation (cf. Gordonoff *et al.*, A., 1933, 435).

F. O. H.

**Calcium deposits in nerve cells of white rats after injections of urea and cholesterol.** R. C. MACCARDLE (*Anat. Rec.*, 1936, 67, 81—85).—Intraperitoneal injections of cholesterol (I) or urea cause Ca deposition in the ganglion cells of the medulla oblongata and the motor cells of the spinal cord. Cryst. (I), and possibly urea, are deposited in cytoplasmic vacuoles. Ca deposition is usually preceded by fatty accumulation, but Ca soap formation cannot be detected. Urea is considered to favour Ca pptn. by stimulating a higher alkalinity.

R. N. C.

**Sulphæmoglobinæmia following sulphanilamide treatment.** G. DISCOMBE (*Lancet*, 1937, 232, 626—627).—Case reports. Sulphæmoglobinæmia is a commoner result of treatment with p-NH<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·SO<sub>2</sub>·NH<sub>2</sub> than is generally recognised.

L. S. T.

**Peptone shock.** C. A. DRAGSTEDT and F. B. MEAD (*J. Pharm. Exp. Ther.*, 1937, 59, 429—436).—Histamine (I), or a substance closely resembling it, appears in the blood and occasionally also in the thoracic lymph of dogs as a result of peptone (II) shock. It is more probable that the shock is due to liberation of (I) from the tissues than to direct toxic action by (II).

W. McC.

**Megakaryocytes in circulating blood of rabbits inoculated with benzene and with saponin.** E. M. MEDLAR (*Folia Hematol.*, 1935, 53, 397—406).—Saponin causes a greater change in blood-picture than does C<sub>6</sub>H<sub>6</sub>. Megakaryocytes are markedly increased after a few days.

CH. ABS. (p)

**Pharmacological action of coumarin.** K. RAI (*Folia Pharmacol. Japon.*, 1935, 21, 86—101).

CH. ABS. (p)

**[Pharmacology of] phenolphthalein. Urine analysis.** B. FANTUS and J. M. DYNIEWICZ (*J. Amer. Pharm. Assoc.*, 1937, 26, 236—239).—Administration of medicinal doses of phenolphthalein (I) to men is always followed by the occurrence of albumin and conjugated (I), but seldom of free (I), in the urine; with larger doses, the occurrence of free (I) is more frequent.

F. O. H.

**Action of dinitrophenol and insulin on the metabolism of ethyl alcohol.** H. W. NEWMAN and W. C. CUTTING (*J. Clin. Invest.*, 1935, 14, 945—948).—Dinitrophenol (1 in 5—20 × 10<sup>6</sup>) increased the rate of metabolism of EtOH by rat-liver tissue *in vitro*. Insulin (I) and (I)-free pancreatic tissue affect the oxidation of EtOH in the absence of liver tissue. The factor responsible for this action is discussed.

CH. ABS. (p)

**Synergic calorogenic actions of adrenaline and dinitrophenol.** V. E. HALL and P. E. CHAMBERLIN

(J. Pharm. Exp. Ther., 1937, 59, 451—457).—In anæsthetised cats, the increased rate of  $O_2$  consumption caused by intramuscular injection of 1:2:4- $OH \cdot C_6H_3(NO_2)_2$  (I) is reinforced by previous or simultaneous infusion, at physiological rate, of adrenaline (II), the effect being  $>$  the sum of the effects produced by (I) and (II) given separately.

W. McC.

**Experimental convulsions induced by administration of thujone. Influence of the autonomic nervous system on these convulsions.** H. M. KEITH and G. W. STAVRAKY (Arch. Neurol. Psychiat., 1935, 34, 1022—1040).—Sympathetic stimulants [adrenaline, pitressin, nicotine (I), histamine] increased and parasympathetic stimulants (acetylcholine, acetyl- $\beta$ -methylcholine, pilocarpine, eserine) tended to prevent the convulsions. Atropine abolished the effect of parasympathetic drugs but had no action on convulsions. Large doses of (I) and ergotamine prevented the convulsions in some cases.

CH. ABS. (p)

**Physiological action of 6-tetralon and its hydrogenated derivatives.** H. R. KANITZ and H. BLESS (Arch. Hyg. Bakt., 1937, 117, 321—331).—6-Tetralon (2-ketotetrahydronaphthalene) when injected subcutaneously or given orally as bisulphite to rats causes a rapid lowering of body temp. to about  $28^\circ$ . 0.0005*M* is toxic but not lethal. A related anthracene derivative (1-octhracenon) possesses similar properties, but hydrogenated derivatives of anthracene and phenanthrene are inactive.

W. L. D.

**Allergic phenomena produced by aromatic amines.** F. NITTI, D. BOVET, and F. DEPIERRE (Compt. rend. Soc. Biol., 1937, 124, 1164—1166).—The activity of  $p$ - $C_6H_4(NH_2)_2$  is due to the reactivity of  $p$ - $(NH_2)_2$ . It is decreased by electro-negative groups in the  $o$ -position and is either not affected or is increased by electro-positive groups.

H. G. R.

**Therapeutic action of arsenobenzene associated with sodium dehydrocholate.** L. JACCHIA and G. TRUFFI (Arch. Dermatol. Syphilis, 1934, 170, 550—571).—Na dehydrocholate has a favourable influence in As therapy.

CH. ABS. (p)

**Application of hydrotropy to acceleration of hydrolysis of Yperite.** B. ZAWADZKI (Przemysl Chem., 1935, 19, 239—245).—The solubility in  $H_2O$  and the degree of hydrolysis in solution of  $(CH_2Cl \cdot CH_2)_2S$  (I) are greatly increased by bile salts, particularly in presence of  $NaHCO_3$ , which has no action in their absence. The solubility of (I) in horse serum is  $<$  in  $H_2O$ , but is also increased by hydrotropic substances.

R. T.

**Liver-glycogen in starvation. Effect of nucleic acid, bile acid, and insulin. Effect of nucleic acid with or without cholic acid on fasting blood-sugar. Production of bile acids in the dog. Effect of cholic acid and cholesterol on regeneration of glycogen in the liver after administration of egg white or edestin.** T. FUKASE (Arb. med. Fak. Okayama, 1936, 5, 116—123, 124—128, 129—138, 139—144).—I. The glycogen (I) content of the liver in fasting rabbits is increased by administration

of cholic acid (II) by ingestion of nucleic acid (III), and by the simultaneous administration of (II) and (III). Injection of insulin produces a high (I) content.

II. (III) given alone by mouth to fasting rabbits has no effect on the blood-sugar level, but in conjunction with intravenous injection of (II) it appears to increase slightly the hypoglycæmic effect of (II). Parenteral administration of (III) does not affect the hyperglycæmic effect of ingested glucose.

III. In dogs with a bile fistula, ingestion of egg yolk, raw or cooked, or its  $Et_2O$  extract causes increased secretion of bile, the total dry wt., ash, and taurocholic acid content increasing. The  $EtOH$  extract has the same effect, but to a smaller degree. Egg white has no influence on bile secretion.

IV. The production of (I) in the liver of fasting rabbits is stimulated by the ingestion of egg white or edestin (IV). Simultaneous ingestion of (II) increases the effect of the egg white but scarcely affects that of the (IV). Administration of cholesterol does not influence the effect of egg white.

NUTR. ABS. (m)

**Synergy of adrenaline and acetylcholine on pulmonary blood vessels in rabbits.** G. H. ETTINGER and G. E. HALL (Quart. J. Exp. Physiol., 1935, 25, 259—265).—In perfused blood vessels repeated injections of acetylcholine produce a condition in which the muscles fail to respond to the normal constricting influence. Sensitivity is restored by adrenaline, Ba, or histamine.

CH. ABS. (p)

**Influence of certain fruits on faecal flora and intestinal reaction in diets of rats.** W. B. ESSELEN, jun. (Food Res., 1937, 2, 65—72).—Addition of cranberry, bilberry, and apple to the diet reduced the nos. of faecal gas-producing organisms and *Escherichia coli*, decreased intestinal putrefaction (Bergeim  $Fe_2O_3$ -reduction test), and increased the  $[H^+]$  of the contents of the large intestine and caecum.

E. C. S.

**Fractionation of substances which intervene in the optical pigmentation of *Drosophila melanogaster*.** Y. KHOUVINE and B. EFRUSSI (Compt. rend. Soc. Biol., 1937, 124, 885—887).—The dialysable portion of the nitrogenous fraction obtained from an extract of the pupæ of *Calliphora erythrocephala* is most active.

H. G. R.

**Manometric studies on the effect of tissue extract on calcium precipitation.** A. LASNITZKI (Biochem. J., 1937, 31, 706—710).—Liver and kidney extracts and dil. serum inhibit Ca pptn. in aq. 0.018*M*- $CaCl_2$  containing  $NaHCO_3$  and  $CO_2$  in physiological concn. at  $37^\circ$ .

P. G. M.

**Stimulating materials obtained from injured and killed cells.** J. C. FARDON, R. J. NORRIS, J. R. LOOFBOUROW, and M. V. RUDDY (Nature, 1937, 139, 589).—Living cells injured or killed by ultra-violet light produce substances that stimulate respiration etc. Irradiated yeast, liver, kidney, and embryo tissues give active substances which pass through a Seitz filter or a dialysing membrane. The different degrees of potency with regard to stimulation of respiration, proliferation, and fermentation observed

suggest the existence of at least three substances responsible for the effects. L. S. T.

**Vinyl ether anaesthesia in dogs.** W. BOURNE and B. B. RAGINSKY (Brit. J. Anaesthesia, 1935, 12, No. 2, 62—69).—Liver function was not disturbed by the anaesthetic. CHEM. ABS. (p)

**Vinyl ether obstetrical anaesthesia for general practice.** W. BOURNE (Canad. Med. Assoc. J., 1935, 33, 629—632).—Given a closed system with O<sub>2</sub> vinyl ether gives satisfactory results. CH. ABS. (p)

**cycloPropane: a new gas anaesthetic.** Report of 120 cases. G. S. MECHLING (J. Oklahoma State Med. Assoc., 1935, 28, 436—439).—*cycloPropane* (I) is a safe inhalation anaesthetic. The explosive range with O<sub>2</sub> is 25–75 to 71–29 vol.-% of (I) and O<sub>2</sub>, respectively. CH. ABS. (p)

**Local anaesthetics from cytosine.** H. R. ING and R. P. PATEL (J. Pharm. Exp. Ther., 1937, 59, 401—412; cf. A., 1937, II, 80).—The conversion of cytosine into its *N*-alkyl esters (7 tested) is accompanied by the development of local anaesthetic properties comparable with those of cocaine and by the disappearance of the nicotine-like properties. W. McC.

**Synthesis of new local anaesthetics.**—See A., II, 243.

**Leucocytosis following inhalation anaesthesia.** I. B. TAYLOR and R. M. WATERS (Anesthesia and Analgesia, 1935, 14, 276—281).—Effects of Et<sub>2</sub>O, N<sub>2</sub>O, C<sub>2</sub>H<sub>4</sub>, and *cyclopropane* are described. CH. ABS. (p)

**Role of fats and lipins in blood during absorption of some indifferent narcotics.** A. I. BRUSILOVSKAJA (J. Physiol. U.S.S.R., 1935, 19, 587—593).—The amounts of fats and lipins in blood of dogs and rabbits do not influence the absorption of C<sub>6</sub>H<sub>6</sub> or benzene by the lungs, or the concn. of these in blood. CH. ABS. (p)

**Effects of narcotics on tissue oxidations.** M. JOWETT and J. H. QUASTEL (Biochem. Z., 1937, 31, 565—578).—The effect of luminal (I), chlorotone (II), and evipan on respiration of tissue slices is investigated. With brain, the respiration is more sensitive to (I) in presence of glucose, lactate (III), and pyruvate (IV) than of other substrates. The inhibition of respiration tends to be independent of time when [K<sup>+</sup>] is high and increases with time when it is low. The inhibition due to (II) develops rapidly and has no temp. coeff. The substrate concn. does not influence the inhibition of respiration and the variation of the inhibition with the narcotic concn. follows a sigmoid curve. With liver, kidney, and diaphragm, oxidation is inhibited both when no substrate is added and in presence of certain substrates, e.g., (IV). Narcotics inhibit the oxidation of butyrate by liver, of (III) to (IV) by brain, and the oxidative deamination of alanine by kidney. Narcotic concns. which produce narcosis *in vivo* are of the same order of magnitude as those which inhibit measurably the respiration of the cerebral cortex *in vitro*. P. W. C.

**Chemotherapy of synthetic hypnotics.** (SIR) U. N. BRAHMACHARI (J. Indian Chem. Soc., 1937, 14, 1—12).—A review (presidential address). E. W. W.

**Delayed heat production of caffeinised frog muscles.** G. SASLOW (J. Cell. Comp. Physiol., 1936, 8, 89—99).—0.02—0.05% caffeine-Ringer solution greatly increased the resting heat rate of frog sartorii in O<sub>2</sub> and the tension produced by stimulation. Little delayed heat was produced after a response; this may be due to utilisation of the energy from exothermic processes, continuously taking place at a very high level, to reverse other exothermic processes closer to the primary process in contraction. M. A. B.

**Antagonism between atropine, acetylcholine, and acetyl-β-methylcholine on the dog's or cat's heart *in situ*.** F. BAYLESS and H. HANDOVSKY (Compt. rend. Soc. Biol., 1937, 124, 988—991).—The antagonism between atropine and acetylcholine and its derivatives depends on the relative rates of decomp. and penetration of these substances. H. G. R.

**Antagonism between acetylcholine and strychnine in the crayfish.** V. BONNET (Compt. rend. Soc. Biol., 1937, 124, 996—998).—Acetylcholine antagonises strychnine only if it is injected first. H. G. R.

**Influence of some drugs of the cocaine group *in vitro* on cultures of fibroblast.** K. SAITO (Folia Pharmacol. Japon., 1935, 21, 1—12).—Cocaine, procaine, tropacocaine, alypine, and tutocaine depress growth of fibroblast. CH. ABS. (p)

**Reaction of the embryonal chick heart to cocaine, procaine, tropacocaine, tutocaine, alypine, psicaine, and β-eucaine with special reference to the development of the heart.** K. MIZUGAKI (Folia Pharmacol. Japon., 1935, 21, 102—113).—The drugs depress the 2-day embryonal heart and act more strongly as age increases. CH. ABS. (p)

**Pharmacology of an alkaloid isolated from Chinese fengfangchi.** L. P. KING and Y. K. SHIH (Bull. Nat. Acad. Peiping, 1935, 6, No. 3, 13—50).—The isolation of the alkaloid *fangchinine* (m.p. 218°,  $[\alpha]_D^{25} +268.7^\circ$ , is described. The physiological action resembles that of other alkaloids of Menispermaceae but is more intense. CH. ABS. (p)

**Influence of harmine on blood picture and hydrogen-ion concentration of rabbit blood.** R. UCHIBASHI (Folia Pharmacol. Japon., 1935, 21, 76—85).—In normal rabbits harmine (I) decreases plasma-Ca and -p<sub>H</sub>. Atropine has no influence on this action. No change occurs when (I) is given after yohimbine or after double splanchnectomy. CH. ABS. (p)

**Metycaine.** ANON. (J. Amer. Med. Assoc., 1934, 102, 456).—Metycaine, the hydrochloride of γ-2-methylpiperidinopropyl benzoate, is compared with procaine; intravenously it is about three times as toxic. CH. ABS. (p)

**Action of medicines on auricular fibrillation.** I. Influence of hydroquinine, hydroquinidine, quinine, and hydroquinidine-free quinidine on auricular fibrillation in cats. S. DE BOER and

H. H. J. HOLTOAMP. II. Action of hydroquinidine, quinidine, hydroquinine, and quinine. S. DE BOER and A. BROUWER (Proc. K. Akad. Wetensch. Amsterdam, 1936, 39, 266—271, 1937, 40, 77—82).—I. Previously recorded anti-fibrillation effects of quinine and quinidine are in part attributable to hydro-quinine and -quinidine present in earlier samples.

II. Quinine and quinidine are at least as effective in preventing auricular fibrillation in cats as the corresponding hydro-derivatives. M. H. M. A.

Detection of strychnine in carcasses and corpses. D. G. STEYN (Onderstepoort J. Vet. Sci., 1935, 5, 139—174).—A review and discussion.

CH. ABS. (e)

Potency of the cardiac glucosides calotropin,  $\alpha$ -antiarin, emicymarin, folinerin, and sarmentocymarin. K. K. CHEN, R. C. ANDERSON, and E. B. ROBBINS (J. Amer. Pharm. Assoc., 1937, 26, 214—218).—Data for the pharmacological response in cats and frogs are tabulated. Calotropin has a potency equal to that of ouabain,  $\alpha$ - is less potent than  $\beta$ -antiarin, folinerin has a high emetic action, whilst sarmentocymarin has a potency in cats similar to that of digoxin. F. O. H.

Constitution of marinobufagin, cinobufagin, and gamabufagin.—See A., II, 254.

Comparative toxicity and elimination of some constituents of derris. A. M. AMBROSE and H. B. HAAG (Ind. Eng. Chem., 1937, 29, 429—431).—The lethal oral dose of rotenone, per kg. body-wt., was 3.0 g. for rabbits, 0.6 g. for rats, and 0.06 g. for guinea-pigs. Toxic doses for guinea-pigs of other constituents were: deguelin 1.0 g., toxicarol 0.5 g., dehydrorotenone > 1.5 g., and dihydrorotenone 0.15 g. With rabbits and rats 1.5 g. of these substances showed little or no effect. Derris constituents are probably excreted unchanged in the faeces.

L. D. G.

New group of alimentary constituents (alitoxins) and their pathological effects. L. A. TSCHERKES (J. Physiol. Path. gen., 1936, 34, 808—814).—In mice on a diet consisting mainly of cereals or beans with addition of milk, yeast, and cod-liver oil, symptoms appeared similar to those of vitamin- $B_2$  deficiency and pellagra in man but which neither yeast nor  $B_2$  cure. Probably the cause is some sp. constituent (alitoxin) of foods. Some alitoxins are destroyed by heat, and all are destroyed by HCl.

NUTR. ABS. (m)

Treatment of aspirin poisoning by intravenous sodium lactate solution. S. W. WILLIAMS and R. M. PANTING (Brit. Med. J., 1937, 550—552).—The toxicity of aspirin (I) is due to an acidosis and possibly to direct action of salicylic acid on the respiratory centre. Alkalis increase the absorbability of (I). A. G. P.

Biological testing of tryparsamide. L. LAUNOY and M. PRIEUR (Bull. Soc. Path. exp., 1935, [v], 28, 389—398).—The tests depend on observations of survival periods. CH. ABS. (p)

Structure and toxicity of arsinic acids of the diphenylamine series.—See A., II, 267.

Toxicology of cobalt. F. CAUJOLLE and S. LAFFITE (J. Pharm. Chim., 1937, [viii], 25, 352—371).—Toxicity in dogs is produced only by large doses of Co salts. Urinary elimination is slow whilst the bile is an important vehicle of excretion. In severe Co poisoning, Co accumulates mostly in the liver, and, to a smaller extent, in pancreas, kidney, and brain. Methods for the determination of Co in tissues etc. are discussed. R. M. M. O.

Cobalt salts as prophylactic and therapeutic antidotes in cyanide poisoning. V. M. ROSHKOV, N. S. STEPANENKO, and K. M. USOVA (J. Physiol. U.S.S.R., 1935, 12, 582—584).— $\text{Co}(\text{NO}_3)_2$ ,  $\text{CoCl}_2$ , and  $\text{CoSO}_4$  act as antidotes for HCN poisoning in white mice. CH. ABS. (p)

Methæmoglobin builders as antidotes in fluoride poisoning. O. G. VINOGRADOVA and V. M. ROSHKOV (J. Physiol. U.S.S.R., 1935, 19, 585—586).—Methæmoglobin produced by injection of  $\text{NaNO}_2$  into F-poisoned mice combines with  $\text{F}^-$  and lowers blood- $\text{F}^-$ . CH. ABS. (p)

Chronic lead poisoning in early childhood. H. H. DONNALLY, C. A. SCHUTZ, and A. NIEMETZ (Virginia Med. Month., 1935, 62, No. 2, 83—89).—In cases examined Pb poisoning diminished the  $\delta$  of the ends of rapidly-growing bones. X-Ray diagnosis was successful. CH. ABS. (p)

Acute mercury poisoning in a respiration chamber. H. CHRISTENSEN, M. KROGH, and M. NIELSEN (Nature, 1937, 139, 626—627).—Symptoms of Hg poisoning result from the presence of Hg spilled on the floor of badly ventilated rooms.

L. S. T.

Effect of selenium-containing foodstuffs on growth and reproduction of rats of various ages. K. W. FRANKE and V. R. POTTER (J. Nutrition, 1936, 12, 205—214).—Resistance of rats to toxic wheat was high at the age of 21—42 days. Rats surviving toxic diets for considerable periods showed sub-normal growth and loss of reproductive power. Matings of animals which had both received toxic diets were completely infertile. A. G. P.

Formation of colloidal elements of the arsenic and tellurium groups by oxidation and reduction processes as the cause of poisoning of animal cell structures and enzymes by  $\text{AsH}_3$ ,  $\text{H}_2\text{S}$ ,  $\text{TeO}_2$ , etc. R. LABES (Kolloid-Z., 1937, 79, 1—10; cf. A., 1935, 1277).—Both  $\text{AsH}_3$  and  $\text{H}_2\text{S}$  cause haemolysis of red blood corpuscles and abolish the excitability of a nerve-muscle prep. when  $\text{O}_2$  is present, but not in its absence. Similar effects are produced by addition of colloidal solutions of As or S (Raffo). Addition of  $\text{K}_2\text{TeO}_3$  to triturated muscle does not inhibit the oxidation of  $p\text{-C}_6\text{H}_4(\text{NH}_2)_2$  by the oxidases present, but gradually destroys the activity of succinic acid dehydrogenase. It is inferred that the poisoning effect in both cases is due to the formation of the colloidal element, and that whereas  $\text{AsH}_3$  and  $\text{H}_2\text{S}$  attack oxidising centres,  $\text{TeO}_2$  poisons only reducing centres. F. L. U.

Mode of action of the protein of the yellow enzyme. E. HAAS (Biochem. Z., 1937, 290, 291—292).—The reactions between the yellow enzyme

and di- and tri-phosphopyridine nucleotide (I) have  $k$   $3 \times 10^5$  and  $>3 \times 10^6$ , respectively, but these vals. are zero if the protein-free enzyme is used. If the enzyme, followed by sufficient  $\text{Na}_2\text{S}_2\text{O}_4$ , partly to reduce the nucleotide (absence of  $\text{O}_2$ ), is added to a large excess of (I) at neutral reaction and  $0^\circ$ , a red substance (II) is produced. (II) is not produced when the concn. of (I) is not proportionately very large or if the enzyme is replaced by its free active group or free protein. (II), which is apparently a flavin-protein nucleotide, exhibits absorption bands at 360 and 475  $\text{m}\mu$ . W. McC.

**Biochemical hydrogenations. V. Enzymic hydrogenation of unsaturated compounds.** F. G. FISCHER and H. EYSENBACH (Annalen, 1937, 529, 87—108; cf. A., 1935, 123; 1937, II, 225).—Hydrogenation of  $\text{CHPh}\cdot\text{CH}\cdot\text{CH}_2\cdot\text{OH}$  or  $\text{CHPh}\cdot\text{CH}\cdot\text{CHO}$  in presence of fermenting yeast occurs most rapidly at  $p_{\text{H}}$  8.5. The clear solutions obtained by plasmolysis of pressed beer yeast with  $\text{EtOAc}$  or other media hydrogenate  $\text{CHPh}\cdot\text{CH}\cdot\text{CH}_2\cdot\text{OH}$  or geraniol nearly as rapidly as an equal wt. of the living cells although they are much less active towards sugars. Dried yeast and its maceration extracts are similarly active. Evolution of  $\text{CO}_2$  from the fermenting solutions usually ceases completely after addition of the unsaturated alcohol and is resumed weakly or not at all. Hydrogenation can therefore occur when the complete course of alcoholic fermentation is suppressed. Repression of the normal course of fermentation in two places (by  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  or  $\text{NaF}$ , respectively) does not necessarily affect the rate of saturation of an olefine. There appear to be several available sources of H for the hydrogenation. Attempts are described with various combinations of purified enzyme preps. to determine which components of the H-transferring systems participate in the hydrogenation of olefines. It appears that the known H-displacements which immediately reduce codehydrogenases can also induce hydrogenation of the double linking; the yellow enzyme is invariably present but it is questionable whether it is necessary or not for ethylenic hydrogenation. The possible existence of particular "ethylenehydrogenases" which complete the final transition of H to the unsaturated substrate remains undecided but is assumed for the present. It is supported by experiments in which solutions of the enzyme, the ethylenic substance (crotyl alcohol,  $\text{CHPh}\cdot\text{CH}\cdot\text{CH}_2\cdot\text{OH}$ , geraniol, or citral but not citronellol or citronellal), and a suitable dye (Janus-red, methylene-violet, or rosinduline GG but not methylen-blue or indigo-carmin) are decolorised by  $\text{Na}_2\text{S}_2\text{O}_4$  in absence of  $\text{O}_2$ . If the enzyme is active towards the substrate, the solution becomes coloured until the leuco-compound is completely oxidised; otherwise it remains colourless. H. W.

**Codehydrogenases. I. Nature of growth factor "V."** II. Physiological function of growth factor "V." A. Lvov and M. Lvov (Proc. Roy. Soc., 1937, 122, B, 352—359, 360—373).—I. The growth factor "V" required by *Hæmophilus parainfluenzæ* and obtained from yeast extract has properties in common with cozymase (I). V can be replaced by both (I) and Warburg's co-enzyme,

V and codehydrogenases (II), but not reduced (II), are thermolabile in alkaline solution. Organisms needing V for growth have lost the power to synthesise pyridine nucleotide phosphates. By means of a growth test with *H. parainfluenzæ*  $4 \times 10^{-9}$  g. of (II) is detectable.

II. A more detailed account of matter previously abstracted (cf. this vol., 36). E. A. H. R.

**Dehydrogenases of human placenta.** T. THUNBERG (Biochimia, 1937, 2, 413—422).—The decolorisation of methylene-blue by human placenta is greatly stimulated by addition of succinic (I) and glycerophosphoric (II) acid, slightly stimulated by lactic, citric, glyceric, aspartic, glutamic, and hexosediphosphoric acid and leucine, and inhibited by  $\text{H}_2\text{C}_2\text{O}_4$ , malic and fumaric acid. Inhibition may be due to decomp. products of the added material. Decolorisation of thionine is stimulated by (I) and (II). W. McC.

**Components of succinate-fumarate-enzyme system.** E. STOTZ and A. B. HASTINGS (J. Biol. Chem., 1937, 118, 479—498).—The prep. of a succinic dehydrogenase (free from fumarase) from ox heart is described. Oxidation of succinate by this enzyme was unimol. The enzyme consists of two factors: (a) the dehydrogenase factor which is sp. for the oxidation of succinate, is destroyed by heating at  $55^\circ$  for  $\frac{3}{4}$  hr., is completely inhibited by  $\text{SeO}_3^{''}$ , and is not replaceable by dyes; and (b) the oxidase factor which activates  $\text{O}_2$ , is destroyed by heating to  $75^\circ$ , is completely inhibited by  $\text{CN}'$ , and is replaceable by dyes, the extent of the replacement depending on their oxidation-reduction potentials. J. N. A.

**Influence of various substances on the lactic acid dehydrogenase in heart muscle.** I. YAMAMOTO (Fukuoka Ik. Zasshi, 1934, 27, 2767—2772).—The inhibitory effect of  $\text{H}_2\text{C}_2\text{O}_4$  on the enzyme is independent of its action in pptg. Ca.  $\text{NaF}$  and Na citrate have no effect. Lactates of Na, Li, K,  $\text{NH}_4$ , and Ca are readily oxidised. The dehydrogenase is inhibited by Ag, Hg, and Cu but unaffected by alkaloids, insulin, adrenaline, or nicotine.

CH. ABS. (p)

**Hæmatin compound of peroxidase.** D. KEILIN and T. MANN (Proc. Roy. Soc., 1937, B, 122, 119—133).—Horse-radish peroxidase preps. show an absorption of the methæmoglobin type (bands 645, 683, 548, 498  $\text{m}\mu$  in acid solution, 583 and 549  $\text{m}\mu$  in alkaline solution). These are derivatives of  $\text{Fe}^{\text{III}}$ . The behaviour and spectra of these substances on reduction, and of their compounds with  $\text{NaF}$ ,  $\text{KCN}$ ,  $\text{H}_2\text{S}$ ,  $\text{NO}$ ,  $\text{NaN}_3$ ,  $\text{NH}_2\text{OH}$ , and  $\text{H}_2\text{O}_2$  are described. There is an approx. relation between enzymic activity and hæmatin (I) content, but other (I) compounds are present. The peroxidase-(I) compound is probably identical with the enzyme. F. A. A.

**Catalase and peroxidase activity of the liver cell.** E. E. DUNN and S. MORGULIS (J. Biol. Chem., 1937, 118, 545—547).—The catalase activity of the rat liver cell in Tyrode's solution at  $2^\circ$  shows practically no variation from  $p_{\text{H}}$  6.38 to 7.82. The results differ from those of Regenbogen. J. N. A.

**Constitution and mode of action of catalase.** K. G. STERN (Biochimia, 1937, 2, 198—215).—A review. W. McC.

**Catalase activation in living cells.** III. K. YAMAFUJI (Biochem. Z., 1937, 290, 209—212; cf. A., 1936, 1296).—The catalase in aq. suspensions of yeast is activated by mitogenetic radiation from rabbit's blood, pulped silk-worm pupæ, and silk-worm's eggs. As regards their power to transmit the rays, glass and cryst. and fused  $\text{SiO}_2$  do not differ greatly. Blood diluted with 0.001N-KCN does not differ from blood hemolysed with  $\text{H}_2\text{O}$  as regards mitogenetic action on yeast. W. McC.

**Spectroscopy of catalase.** K. G. STERN (J. Gen. Physiol., 1937, 20, 631—648).—The effect of reagents on the spectral absorption of catalase (I) indicates that (I) is resistant to oxidising [e.g.,  $\text{Fe}(\text{CN})_6'''$ ] and reducing agents. The hæmin group of (I) does not combine with  $\text{CN}'$ ,  $\text{S}''$ ,  $\text{NO}$ ,  $\text{F}'$ , and  $\text{CO}$ . (I) is therefore a  $\text{Fe}^{\text{III}}$  complex. The stability of the  $\text{Fe}'''$  in (I) towards reducing agents is due not to the structure of the porphyrin with which it is combined but to the protein component. E. A. H. R.

**Differences between similar enzymes in relation to their origin.** A. V. BLAGOVESHCHENSKI (Biochimia, 1937, 2, 154—167).—Catalase (I) from phylogenetically young plants has greater power to decrease the energy of activation of  $\text{H}_2\text{O}_2$  decomp. than has (I) from phylogenetically old plants. Blood-(I) varies in quality according to the genus to which the animal belongs. The quality of (I) and of the proteolytic enzymes concerned in the autolysis of blood and tissues is higher in young than in old animals. W. McC.

**Nomenclature of the enzymes acting on fumaric acid.** K. P. JACOBSON (Compt. rend. Soc. Biol., 1937, 124, 1028—1030). H. G. R.

**Aldehyde mutase.** M. DIXON and C. LUTWAK-MANN (Nature, 1937, 139, 548—549).—Aldehyde mutase and aldehyde oxidase, hitherto believed to be identical, are distinct enzymes and have been separated. Their fundamental differences in behaviour are described. L. S. T.

**Enzymic synthesis of carbohydrate chains.** VII. Existence of carboglycase. A. KUZIN (Biochimia, 1937, 2, 70—81).—Yeast carboglycase preps. convert  $\text{MeCHO}$  into acetoin, the yield of which increases with rising  $[\text{MeCHO}]$  to a max., and then falls. Higher yields are obtained in presence of  $\text{CaCO}_3$ . Decarboxylation does not take place during the reaction. R. T.

**Hypothetical existence of enzymes analogous to aspartase.** K. P. JACOBSON and M. SOARES (Compt. rend. Soc. Biol., 1937, 124, 1026—1028).—Fixation of  $\text{NH}_2\text{OH}$  or  $\text{N}_2\text{H}_4$  by fumaric acid in presence of liver juice in the absence of aspartase is enzymic and is not due to fixation of  $\text{NH}_3$  after decomp. of the bases. H. G. R.

**Specificity of the structure of aspartase.** M. SOARES (Compt. rend. Soc. Biol., 1937, 124, 1030—1032).—The enzyme prep. from *B. coli* affects only the fixation of  $\text{NH}_2\text{OH}$  and  $\text{N}_2\text{H}_4$  and not their Me derivatives. H. G. R.

**Effect of tyrosinase on the oxidation and cardiac effects of adrenaline and tyramine.** P. HEIRMAN (Compt. rend. Soc. Biol., 1937, 124, 1250—1251).—During the oxidation of adrenaline and tyramine with tyrosinase, a substance which inhibits the inotropism and chronotropism of the frog's heart is formed. H. G. R.

**Occurrence of a phytin-splitting enzyme in the intestines of rats.** V. N. PATWARDHAN (Biochem. J., 1937, 31, 560—564).—Enzyme preps. from the intestines of rats of all ages contain, in addition to glycerophosphatase, a phytase (optimum  $p_{\text{H}}$  7.8) which liberates  $\text{H}_3\text{PO}_4$  from Na inositol hexaphosphate, the action being accelerated by  $\text{Mg}''$ . Intestines of guinea-pigs and rabbits yield inactive or feebly active extracts. P. W. C.

**Placental enzymes. Phosphoesterase.** D. P. DA CUNHA (Compt. rend. Soc. Biol., 1937, 124, 1023—1025).—A phosphoesterase occurs in human placenta. H. G. R.

**Choline esterase in striated muscle.** A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 124, 942—944).—The concn. of the enzyme is greatest at the nerve endings. This is not observed in the pulverised muscle, probably on account of a diffusion process. H. G. R.

**Properties of choline esterase in human serum.** D. GLICK (Biochem. J., 1937, 31, 521—525).—The continuous titration method of Stedman (A., 1933, 315, 1081) is modified for examining the choline esterase activity in solutions containing only enzyme and substrate. The activity- $p_{\text{H}}$  curve shows a max. at  $p_{\text{H}}$  8.4—8.5. The affinity of the enzyme for acetylcholine is determined and the dissociation const. found to be 0.0011. The absence of excess substrate inhibition is confirmed. P. W. C.

**Fungal enzymes. Proteolytic and carbohydrate-splitting enzymes.** L. VAMOS (Zentr. Bakt. Par., 1936, I, 136, 80—84).—The proteolytic activity of extracts of culture media of *Achorion*, *Tricophyton*, and *Microsporon* spp. was in the (descending) order named. A. G. P.

**Digestive enzymes of the Onychophora (*Peripatopsis* spp.).** N. G. HEATLEY (J. Exp. Biol., 1936, 13, 329—343).—The  $p_{\text{H}}$  of the gut is 6.0—8.2 (usually approx. 7.0). Amylase, glycogenase, protease, and carboxypolypeptidase (I) are present in the salivary glands and invertase, maltase, lipase, esterase, aminopolypeptidase, (I), and dipeptidase in the gut. Gelatin is liquefied by the gut, but only at  $p_{\text{H}}$  3.0. NUTR. ABS. (m)

**Synthetic substrates for chymotrypsin.**—See A., II, 234.

**Enzymic activity of egg-white: its bearing on watery whites.** E. VAN MANEN and C. RIMINGTON (Onderstepoort J. Vet. Sci., 1935, 5, 329—344).—Neither thick nor thin egg-white at  $p_{\text{H}}$  5.5—8.5 undergoes autolysis at 37°. No proteolytic enzymes were detected at any  $p_{\text{H}}$  examined. The presence of two crepsin-like enzymes is demonstrated. The work of Balls and Swenson (B., 1934, 648) is criticised.

CH. ABS. (p)

**Determination of papain with hæmoglobin.** M. L. ANSON (*J. Gen. Physiol.*, 1937, 20, 561—563).—Papain, after activation by CN' in strongly alkaline solution, may be determined by the hæmoglobin method used by Anson and Mirsky (*A.*, 1934, 111) for trypsin. A papain unit is defined.

E. A. H. R.

**Determination of cathepsin with hæmoglobin and the partial purification of cathepsin.** M. L. ANSON (*J. Gen. Physiol.*, 1937, 20, 565—574).—Cathepsin (I), the prep. of which is described, may be determined like trypsin by the Anson-Mirsky method (*A.*, 1934, 111). Liver extracts contain, in addition to (I), other proteolytic enzymes which digest the products formed by (I). This further digestion, but not digestion by (I), is increased by cysteine and decreased by  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ . Gelatin is digested only slightly by (I). A (I) unit is defined.

E. A. H. R.

**Northrop's crystalline pepsin and Brücke's protein-free pepsin.** H. KRAUT and E. TRIA (*Biochem. Z.*, 1937, 290, 277—288; cf. Willstätter and Rohdewald, *A.*, 1932, 881; Northrop, *A.*, 1930, 1317).—Cryst. pepsin (I) prepared by Northrop's method and protein-free (I) prepared by the methods of von Brücke and Sundberg contain 15.5 and 8.2% of N, respectively, the first containing much, the second little or no, tyrosine and tryptophan. The two forms differ in the rate at which they hydrolyse caseinogen although the optimal  $p_{\text{H}}$  for the action of both is 2. Possibly the same active group occurs combined with different carriers in the two forms.

W. McC.

**Substances affecting adult tissue *in vitro*.** I. Stimulating action of trypsin on fresh adult tissue. II. A growth inhibitor in adult tissue. H. S. SIMMS and N. P. STILLMAN (*J. Gen. Physiol.*, 1937, 20, 603—619, 621—629).—I. Trypsin, independent of its degree of purity, and papain stimulate the growth of adult tissue. The stimulation is due to proteolytic action. An inhibitory protein is probably digested.

II. A growth inhibitor can be separated from the fluid in which adult aorta tissue has been digested with trypsin by successive pptn. with EtOH and  $\text{CaCl}_2\text{--NaOH}$ . It is moderately thermostable, and is rendered sol. without destruction by moderate tryptic digestion. Its physical and chemical properties coincide with those of lactenin (Jones and Simms, *A.*, 1930, 820). This tissue inhibitor is believed to play a rôle in limiting the growth of tissue in the adult animal.

E. A. H. R.

**Degradation of starch by amylases.** IV. Action of malt amylase on  $\alpha$ -amylodextrin. K. BAILEY, R. H. HOPKINS, and (in part) D. E. DOLBY (*Biochem. J.*, 1937, 31, 586—590; cf. *A.*, 1936, 637).—When  $\alpha$ -amylodextrin is degraded by malt amylase at room temp., there occur a relatively rapid reaction in which maltose is the principal sugar produced,  $\alpha$ -dextrins and  $\beta$ -maltose being probably formed in equiv. reducing and mutarotatory proportions, and a relatively slow reaction, apparently linear, during which glucose is formed. There is no well-defined point of demarcation between these stages unless low

concns. of enzyme are employed. A new technique is described for determining the sense of mutarotation in enzyme-substrate mixtures of highly colloidal character.

P. W. C.

**Taka-amylase.** XVII. Maltase-free taka-amylase. XVIII. Product of saccharification, limit of decomposition, and reaction velocity coefficient of the decomposition of starch by taka-amylase. XIX. Saccharification of starch by takadiastase. T. KITANO (*J. Soc. Chem. Ind. Japan*, 1937, 40, 37—38B, 38—41B, 41—43B).—XVII. Taka-amylase (I), prepared free from maltase by adsorption methods, shows all the usual protein reactions. The  $p_{\text{H}}$  optimum (5.2 at 38°) depends on the temp. and increases with the duration of the enzymic reaction. Starch (II) on incubation with (I) loses its ability to form the blue I-compound before saccharification is appreciable. (I) is therefore  $\alpha$ -amylase. (Cf. this vol., 96.)

XVIII. Incubation of (II) with (I) gives only maltose as an end product. The last stages of decomp. are very slow and the limit of decomp. depends on the (I) concn. This slow decomp. is not due to destruction of (I). Reaction velocity coeffs. (up to 65% decomp.)  $\propto$  (I) concn. and inversely  $\propto$  (II) concn. The coeff. increases 1.6—1.7-fold for every 10° rise in temp.

XIX. Reaction velocity coeffs. are given for the saccharification of (II) by takadiastase. A method is given for the determination of  $\beta$ -amylase activity in takamaltase.

E. A. H. R.

**Effect of peptone, proteinases, and hydrogen sulphide on the amylase content of barley malt.** T. CHRZĄSZCZ and W. ŚWIĄTKOWSKA (*Biochem. Z.*, 1937, 290, 225—234; cf. *A.*, 1936, 1024).—The amylase (I) content of extracts of malt and barley is increased in varying degrees by activation with peptone, papain, rennet, trypsin, and  $\text{H}_2\text{S}$  alone or in various combinations, the various factors in (I) (starch-liquefying, saccharifying, dextrin-producing) being affected to different extents. The increases are due to liberation of (I) and of activators of (I) and to alterations in the (I) mol. Accordingly, in order that (I) of max. activity may be obtained, the extracts must be treated with appropriate activators.

W. McC.

**Relation between temperature and activity of the glycogenolytic enzyme of the liver of poikilothermic animals.** E. TRIA (*Atti R. Accad. Lincei*, 1936, [vi], 24, 389—392).—The variation with temp. of the activity of hepatic amylase is not appreciably different for warm- and cold-blooded animals.

O. J. W.

**Absence of invertase from mushrooms.** N. N. IVANOV and E. V. DODONOVA (*Biochimia*, 1937, 2, 437—441; cf. Weidenhagen, *A.*, 1931, 653).—Mushrooms contain no invertase.

W. McC.

**Cozymase as ampholyte.** O. MEYERHOF, P. OHLMEYER, and W. MOHLE (*Naturwiss.*, 1937, 25, 172).—The isoelectric point of cozymase (I) is  $p_{\text{H}}$  3.1; at lower  $p_{\text{H}}$  vals. (I) migrates towards the cathode. In the electrometric titration curve the titratable groups at  $p_{\text{H}}$  2.2 and 4.0 probably correspond with

the residue of adenylic acid, and the adenine group, respectively. (I) is a "zwitterion." E. A. H. R.

**Enzymic inactivation of cozymase.** H. VON EULER and H. HEIWINKEL (Naturwiss., 1937, 25, 269).—Results showing the rapid inactivation of cozymase (I) after death in various animal tissues and in Jensen sarcoma are tabulated. The enzymic decomp. of (I) does not yield cophosphorylase as glycolysis activation is also destroyed. E. A. H. R.

**Acid hydrolysis of cozymase.** F. SCHLENK (Naturwiss., 1937, 25, 270).—Acid hydrolysis of cozymase yields a substance with cophosphorylase activity, probably identical with adenylic acid.

E. A. H. R.

**Co-enzymes in muscle metabolism.** D. M. NEEDHAM (Biochimia, 1937, 2, 489—493).—A review. W. McC.

**Comparative biochemistry of muscular and electrical tissues.** E. BALDWIN and D. M. NEEDHAM (Proc. Roy. Soc., 1937, B, 122, 197—219).—The electrical organ of the ray *Torpedo* contains enzymes capable of transferring phosphate (I) from phosphoglyceric acid to creatine, adenylic acid (II) acting as a carrier. Echinoid muscle contains enzymes capable of synthesising arginine- (III) and creatine-phosphoric acids (IV). Unstriated muscle of a holothurian can synthesise (III) but not (IV). Muscle extracts from both classes can transfer (I) from phosphopyruvic acid to (II). Among the Echinodermata, the muscles of the *Crinoidea* contain (III) but not (IV), and those of the *Ophiuroidea* (IV) but not (III). The bearing of this on the evolution of vertebrates is discussed; the more primitive phosphagen appears to be (III). F. A. A.

**Are the phosphatases of bone, kidney, intestine, and serum identical? Use of bile acids in differentiation.** O. BODANSKY (J. Biol. Chem., 1937, 118, 341—362).—The ratios of phosphatase (I) activities with various substrates varies for different preps. from a single tissue and so cannot be used for differentiation of enzymes from different tissues. Quinine and cinchonine at  $1.25 \times 10^{-6}M$  and quinine at  $19 \times 10^{-5}M$  had no clear inhibiting effect;  $HgCl_2$  at  $0.00125M$  inhibited slightly but not differentially. Bile salts differentiate intestinal (I) (practically unaffected) from bone- and kidney-(I) (reduced to 40—70% of the original activity according to particular tissue and salt used). This effect is unaltered by adding heat-inactivated extract of any tissue to enzyme from any other and thus implicates primarily the enzyme and not accompanying matter. Vals. calc. from inhibition of single (I) preps. are applicable to determine the inhibition of a mixed prep. Serum-(I) is also inhibited and serum does not protect bone- or kidney-(I). R. M. M. O.

**Determination of phosphatase in blood containing fluoride.** J. E. J. CRUSE and C. F. M. ROSE (Brit. J. Exp. Path., 1936, 17, 267—269).—Bodansky's method is applicable after removal of  $F^-$  by addition of caffeine  $Mg$  salicylate.  $F^-$  inhibits but does not destroy the enzyme. NUTR. ABS. (m)

**Effect of mercury vapour on beer yeast.** N. FLORESCO (Bul. Fac. Ştiinţe Cernauti, 1935, 8, 167—

171; Chem. Zentr., 1936, i, 2959).—Small amounts of  $Hg$  vapour activate and larger amounts inhibit fermentation and  $H_2O_2$  decomp. of yeast. Removal of  $Hg$  after short exposure is followed by recovery of normal activity of the yeast. A. G. P.

**Effect of the electric field of an argon tube on beer yeast.** N. FLORESCO (Bul. Fac. Ştiinţe Cernauti, 1935, 8, 296—306; Chem. Zentr., 1936, i, 2959).—Fermentative activity and  $H_2O_2$  decomp. by yeast are stimulated. A. G. P.

**Kinetics of cell respiration. II. Parallelism between rate of oxygen consumption by *Saccharomyces Wanching* and change in optical rotation of glucose in boric acid buffers. III. Effect of ultra-violet light on rate of oxygen consumption by *S. Wanching*.** P. S. TANG (J. Cell. Comp. Physiol., 1936, 8, 109—115, 117—123; cf. A., 1936, 896).—II. In  $H_3BO_3$  buffer solutions the  $p_H$ -respiration curve shows a min., in contrast to the curves obtained in veronal-Na and  $PO_4^{'''}$  buffers. The min. is correlated with the change in state of glucose in alkaline borate solutions as indicated by changes in  $\alpha$ .

III. The %  $O_2$  consumption decreases with increasing time of exposure according to a logarithmic curve. The small temp. coeff. of the process suggests that at least the primary effect of ultra-violet light is physical, although the secondary effects may be chemical. M. A. B.

**Kinetics of the fermentation of yeast.** G. EMODI and E. SARKÁNY (Biochem. Z., 1937, 290, 71—90).—The  $O_2$  utilisation ( $x$ ) of an amount of yeast ( $H$ ) is related to the respiration time ( $t$ ) using a variety of media (nutrient-free solutions, distilled  $H_2O$ , 1.5%  $KH_2PO_4$ , 0.9%  $NaCl$ ) by the expression  $t = K_1(x/H)^2 + K_2x/H$ , where  $K_1$ ,  $K_2$  are consts. The oxyhamoglobin (I) method always gives higher  $Q_{10}$  vals. than does the manometric method. The rate of respiration in nutrient-free media is independent of  $O_2$  tension so long as the (I) spectrum is visible. P. W. C.

**Products of fermentation of the *S* and *R* forms of yeasts.** F. W. FABIAN and L. J. WICKERHAM (J. Agric. Res., 1937, 54, 147—158).—Differences in the production of  $EtOH$ , volatile acids, and esters by *S* and *R* forms of *Saccharomyces cerevisiae*, Saaz, *S. aceric-sacchari*, *Pichia alcoholophila*, and *Willia anomala* are recorded. Ester production, which commenced 35—45 days after inoculation and was accompanied by disappearance of  $EtOH$  and volatile acids, reached max. with an  $O_2$  supply sufficient to maintain normal growth but was inhibited by deficiency or excess of  $O_2$ . A. G. P.

**Determination of glutathione in dried yeasts used medicinally.** T. SABALITSCHKA (Mikrochem., Molisch Festschr., 1936, 387—392).—Free  $\cdot SH$  glutathione (I) is determined by treating an aq. suspension of the yeast with 22% aq. thiosalicylic acid (II). The filtered liquid is treated with  $KI +$  starch, and titrated with  $0.001N-KIO_3$ . Total (I) is determined by reducing a second portion of the filtrate with  $Zn + H_2SO_4$  before titration. The I consumption other than that due to (I) is found by

extracting a second portion of yeast with 0.35% aq.  $\text{CH}_2\text{O}$ . The liquid is treated with (II), and titrated as before with  $\text{KIO}_3$ . J. S. A.

**Yeast (*Torula pulcherrima*) as a source of vitamin-D.** E. P. KRATINOVA and A. I. POCHIL (Probl. Shivotnovodstva, 1935, No. 9, 93—100).—Treatment with yeast resulted in increase in the N content of silage. Increase of vitamin-D content occurred only after irradiation of the yeast. *Torula* yeast was the most satisfactory in laboratory experiments and in feeding experiments with chickens. Of the different foods silaged, pumpkins were most satisfactory. Use of the food treated with yeast lowered the % of rachitic chickens and the general mortality. NUTR. ABS. (m)

**Subsidiary sterols from yeast. IV. Cryptosterol.**—See A., II, 243.

**Chemistry of mould tissue. XII. Isolation of arginine, histidine, and lysine from *Aspergillus sydowi*.** D. W. WOOLLEY and W. H. PETERSON (J. Biol. Chem., 1937, 118, 363—370).—0.74% of the N in the mycelium is present as histidine (I), 2.7% as lysine (II), and 1.8% as arginine (III). These are min. vals. (III) can be isolated from aq. extracts of fresh tissue and from acid hydrolysates of the insol. residue but is destroyed in autolysis. It is mostly present in combined form. (I) and (II) can be isolated from the autolysate. R. M. M. O.

**Lactic acid production by species of *Rhizopus*.** S. A. WAKSMAN and I. J. HUTCHINGS (J. Amer. Chem. Soc., 1937, 59, 545—547).—Two species of *Rhizopus*, isolated from soil and from composts of decomp. org. matter, produced 60—70% of *d*-lactic acid (I) on a medium containing glucose (or starch), nutrient salts, and  $\text{CaCO}_3$ . Inulin was slowly converted into (I). H. B.

**Casein-degrading powers of the moulds of soft cheese.** K. DREWES (Milch. Forsch., 1937, 18, 289—330).—The floral distribution (moulds, yeasts, lactic acid bacteria, and bacteria peculiar to cottage cheese) of the organisms is described. The micro-organisms mostly responsible for casein degradation and the ripening of the cheese were *Penicillium*, *Oidium*, thermo- and strepto-bacteria, micrococci, and various types of corynebacteria. Considerable evidence of symbiotic growth was obtained; e.g., corynebacteria and proteolytic micrococci hydrolysed casein in conjunction with moulds and mycoderma. With *Penicillium* in mixed culture 50—80% of the casein was degraded. W. L. D.

**Tyrosine in diseased pedipalps.** F. A. BANISTER (Nature, 1937, 139, 469—470).—Tyrosine has been identified by means of X-rays in museum specimens of pedipalps affected by actinomycosis.

L. S. T.

**Mechanism of cell elongation and the properties of the cell wall in connexion with elongation. IV. Molecular structure of chitin cell wall of sporangiophores of *Phycomyces* and its probable bearing on the phenomenon of spiral growth.** A. N. J. HEYN (Protoplasma, 1936, 25, 372—396; cf. A., 1936, 414).—X-Ray diagrams of the chitin (I) of *Phycomyces* are almost identical with

P (A., III.)

those of animal (I). The unit cell has *a* 9.7, *b* 10.4, *c* 4.6 Å. The *b* axis probably has an oblique position ( $13.5^\circ$  from normal), the crystal form being rhombic or monoclinic. The acetylglucosamine residues are linked by glucoside linkings and the carbohydrate part of the mol. lies along the *b* axis. The protein side-chains lie in one plane with the glucose rings parallel to the *a* axis. The dimension of the *c* axis is determined by the transverse distances of the protein chains. In the cell wall of the sporangiophores the *b* axis forms an angle of  $13.5^\circ$  with the long axis of the wall. Spiral growth is probably due to slipping along crystal planes (plane of *b* and *c* axes) arranged obliquely to the length of the wall. M. A. B.

**Nutritional requirements of the pathogenic mould *Trichophyton interdigitale*.** W. A. MOSHER, D. H. SAUNDERS, L. B. KINGERY, and R. J. WILLIAMS (Plant Physiol., 1936, 11, 795—806).—In synthetic media certain  $\text{NH}_2$ -acids are necessary for the growth of the mould. No single acid (except possibly leucine) is indispensable. Aspartic acid (or asparagine) and  $\beta$ -amino- $\alpha$ -hydroxybutyric acid notably favour growth; proline, valine, lysine, phenylalanine, and arginine are less necessary. Tryptophan and tyrosine are synthesised by the mould. All common sugars except lactose are utilised but mannose gives best growth. At least one of the growth-promoting substances, pantothenic acid, inositol, lactoflavin prep., and cryst. vitamin- $B_2$ , is necessary. Simultaneous supplies of the four substances markedly stimulate growth. K,  $\text{NH}_4$ , Zn, Mg, Fe, Mn, Cu, Ca,  $\text{PO}_4'''$ , and  $\text{SO}_4''$  are required and  $\text{Cl}'$  is beneficial. A. G. P.

**Oxygen requirement of fungi.** L. VAMOS (Zentr. Bakt. Par., 1936, I, 136, 76—80).—The  $\text{O}_2$  requirements of some pathogenic fungi are examined. A. G. P.

**Influence of the water and added substances and of  $p_H$  [of the substrate] on the growth of fungal cultures.** H. H. RUSZEK (Zentr. Bakt. Par., 1936, I, 136, 120—124).—The source of  $\text{H}_2\text{O}$ , the nature of the peptone used, and the  $p_H$  of the medium affected the form, colour, and growth of various fungi. A. G. P.

**Duration of acid reaction in digestive vacuoles of *Paramecium caudatum* as a function of the  $p_H$  of the external medium.** M. CHEJFEC (Acta Biol. Exp., 1933, 8, 186—195).—Duration of the acid reaction ( $p_H$  1.6—2.0) in the vacuoles is not greatly dependent on the  $p_H$  of the medium. In the same individual there is no synchronisation of  $p_H$  in different vacuoles. Acidity disappears from all vacuoles on death. CH. ABS. (p)

**Mode of action of germanin in trypanosomiasis.** N. VON JANCZO and H. VON JANCZO (Trop. Dis. Bull., 1935, 32, 22—24).—Bayer 205 (1 : 60,000) destroys all trypanosomes, after a latent period of 24 hr., causing athrepsis through interference with nutrition of the trypanosome. Arsenoxides act in a different manner and produce immediate effects. Germanin renders trypanosomes fit for phagocytosis by reticulo-endothelial cells. CH. ABS. (p)

Effects of arsenicals on *Trypanosoma cruzi* in tissue culture. C. A. KOFOID, E. McNEIL, and F. D. WOOD (J. Pharm. Exp. Ther., 1937, 59, 424—428).—As(S·C<sub>6</sub>H<sub>4</sub>·CO<sub>2</sub>H-o)<sub>3</sub> (I) in concns. < 0.000037M kills *T. cruzi*, Chagas, in embryonic rat's heart in 24 hr. The trypanocidal power of tryparsamide (II) is < that of (I), and carbarsone (III) is slightly trypanocidal only after ultra-violet irradiation, which produces As<sub>2</sub>O<sub>3</sub> from (II) and (III). The Brazilian strain of *T. cruzi* is more susceptible to the action of (I) than is the Californian strain. W. McC.

Growth-promoting activity of some sterols for *Trichomonas columbae*. R. CAILLEAU (Compt. rend. Soc. Biol., 1937, 124, 1042—1044).—The activities of a series of sterols have been tabulated in relation to their structure. H. G. R.

Effect of the oxidation-reduction potential of the medium on the quantum yield of purple sulphur bacteria. D. I. SAPOSHNIKOV (Biochimia, 1937, 2, 181—197).—The photo-reduction of CO<sub>2</sub> by the bacteria is optimal at  $r_H$  14—16 and hence compensation of  $p_H$  and  $E_h$  is possible so long as the required  $r_H$  is maintained. Each quantum of light absorbed reduces 1 mol. of CO<sub>2</sub>. The thermodynamic connexion between the quantum yield and the  $r_H$  val. suggests that similar relations hold in the higher green plants. W. McC.

Nitrate reduction test and its significance in the detection of *Bacillus larva*. A. G. LOCHHEAD (Canad. J. Res., 1937, 15, C, 79—86).—The ability of *B. larva* to accumulate NO<sub>2</sub>' in a suitable medium containing carrot or turnip without added NO<sub>3</sub>' affords a useful diagnostic character. Contamination by *B. orpheus* may interfere with this effect. Of 40 other N-reducing types tested in NO<sub>3</sub>'-nutrient media only *Micrococcus* sp. and *Flavobacterium* sp. showed any accumulation of NO<sub>2</sub>' with [KNO<sub>3</sub>] as low as 0.001%. L. D. G.

Vitality of bacteria. L. RUBENTSHIK and S. S. CHAIT (Ann. Inst. Pasteur, 1937, 58, 446—458).—Samples of black mud from a salt lake were examined after 33 years' storage in sealed tubes containing CO<sub>2</sub> and H<sub>2</sub>, respectively. Viability was approx. the same in each case. L. D. G.

Adsorption of bacteria in salt lakes. L. RUBENTSHIK, M. B. ROISEN, and F. M. BIELJANSKY (J. Bact., 1936, 32, 11—31).—Sediments from salt lakes, notably black plastic mud, adsorb bacteria, and retain this property after oxidation or autoclaving but not after HCl treatment. The nature of the adsorption process is examined. A. G. P.

Fermentation of cellobiose by bacteria. R. P. TITSLER and L. A. SANDHOLZER (J. Bact., 1936, 31, 301—307).—Cellobiose was fermented by approx. 30% of the species examined. The use of this reaction in differentiating certain species is discussed. A. G. P.

Association and antagonistic effects of [soil] micro-organisms.—See B., 1937, 478.

Mechanism of nitrogen fixation by living forms. D. BURK (Biochimia, 1937, 2, 312—331).—A review. M. McC.

Physiology of *Rhizobium*. V. Extent of oxidation of carbonaceous materials. O. R. NEAL and R. H. WALKER (J. Bact., 1936, 32, 183—194; cf. A., 1936, 114).—The rate of O<sub>2</sub> consumption of *R. meliloti* and *R. japonicum* in carbohydrate (I) both increased until approx.  $\frac{1}{2}$  of the amount required for complete oxidation of (I) was consumed, and later declined. This is ascribed to a transition from a (I) to a protein or fat metabolism, much of the un-oxidised (I) being used in the production of new cell tissue. Growth of *R. japonicum* on an arabinose was > on a glucose substrate. A. G. P.

Influence of nitrogenous nutrients on acetone-ethyl alcohol fermentation.—See B., 1937, 486.

Growth of a butanol *Clostridium* in relation to the oxidation-reduction potential and oxygen content of the medium. G. KNAYSI and S. R. DUTKY (J. Bact., 1936, 31, 137—149).—Under anaerobic conditions but in the presence of K<sub>3</sub>Fe(CN)<sub>6</sub> the organism grew in media having an oxidation-reduction potential of +0.335 volt. An O<sub>2</sub> tension sufficient to ensure a potential of +0.300 volt was inhibitory. A. G. P.

Activation of the butanol-acetone fermentation of carbohydrates by *Clostridium acetobutylicum* (Weizmann). C. WEIZMANN and B. ROSENFELD (Biochem J., 1937, 31, 619—639).—Asparagine together with an unknown substance are necessary for normal fermentation in synthetic media. Baker's yeast is plasmolysed with EtOAc and autolysed for 48 hr. at 37°, the activating solution necessary for the fermentation in purely synthetic media being prepared by dialysis of the autolysate against distilled H<sub>2</sub>O and concn. of the dialysate. No complex proteins, peptone, etc. are necessary since these are synthesised by the bacteria. It is not known whether or not the activator is a single substance. Lactoflavin and cozymase have no activating effect. P. G. M.

Fermentation of glucose [and pyruvic acid] with butyric acid bacilli. H. PELDAN (Suomen Kem., 1937, 10, B, 8).—CO<sub>2</sub>, H<sub>2</sub>, HCO<sub>2</sub>H, lactic acid, and AcOH are formed from glucose or AcCO<sub>2</sub>H, in a N<sub>2</sub> atm., glucose yielding also EtOH. Variation of  $p_H$  greatly alters the relative amounts of the products. In a CO<sub>2</sub> atm. Pr<sup>c</sup>CO<sub>2</sub>H is also formed, mainly at the expense of HCO<sub>2</sub>H and also, in the case of glucose media, at the expense of EtOH and AcOH. M. H. M. A.

Essential growth factors for propionic acid bacteria. I. Sources and fractionation. E. L. TATUM, W. H. PETERSON, and E. B. FRED. II. Nature of the Neuberg precipitate fraction of potato: replacement by ammonium sulphate or by certain amino-acids. E. L. TATUM, H. G. WOOD, and W. H. PETERSON (J. Bact., 1936, 32, 157—166, 167—174).—I. Potato extract, orange juice, and yeast-H<sub>2</sub>O stimulate fermentation of glucose and acid production by *Propionibacterium pentoaceticum*, No. 11. The potato extract was active only in presence of another factor which is supplied by EtOH- or H<sub>2</sub>O-extracts of maize. The action of potato extract is due to essential growth

factors and not, primarily, to the available N or buffering capacity of the extract. Potato extract yields two active fractions neither of which is carbohydrate or is destroyed by mild treatment with  $\text{H}_2\text{SO}_4$  or NaOH. One of these is probably an  $\text{NH}_2$ -acid.

II. The action of potato extract is due to its  $\text{NH}_4^+$  and asparagine contents. Urea, glutamic acid, or peptone can replace these but  $\text{NH}_2$ -acids are less effective. The bacteria utilise  $\text{NH}_4^+$  in the presence of the necessary growth factors. A. G. P.

**Isolation and cultural characters of *Clostridium dissolvens*.** J. HANZAWA and S. YOSHIMURA (J. Fac. Agric. Hokkaido, 1935, 39, 1-48).—The organism isolated from soil decomposed none of the common carbohydrates except cellulose, from which were produced  $\text{H}_2$ ,  $\text{CO}_2$ , AcOH, BuOH, EtOH, and a pigment. Vitamin-B or the EtOH extract of faeces was essential for the growth of the organism.

CH. ABS. (p)

**Laboratory culture of "sugar-factory gum."** Effect of "accessory substance" on the growth of "sugar-factory gum." A. MONOYER (Compt. rend. Soc. Biol., 1937, 124, 1008-1014).—The gum can be produced by laboratory culture of the mixed organism (*B. vulgatus* and *Leuconostoc mesenteroides*), the process being continued for several years. H. G. R.

**Effect of atmospheres of hydrogen, carbon dioxide, and oxygen, respectively, and of mixtures of these on growth of *Bacillus subtilis*.** P. P. LEVINE (J. Bact., 1936, 31, 151-160).—Spores of *B. subtilis* do not germinate in pure  $\text{H}_2$  or  $\text{CO}_2$  or in mixtures of these. Their viability is, however, retained and growth recommences on introduction of  $\text{O}_2$ , 4% of which in an atm. of  $\text{CO}_2$  permits germination and vegetative development. Pure  $\text{O}_2$  is neither toxic nor inhibitory to spores. In  $\text{CO}_2$ - $\text{O}_2$  mixtures growth  $\propto \text{O}_2$  content up to atm. proportions.

A. G. P.

**Bacterial growth at constant  $p_{\text{H}}$ . Physiology of *Lactobacillus acidophilus*.** L. G. LONGSWORTH and D. A. MACINNES (J. Bact., 1936, 31, 287-300).—Acid production by the organism is only slightly increased by comparatively large increases in  $\text{O}_2$  and  $\text{CO}_2$  tension. Max. apparent oxidation-reduction potential of the culture is associated with a min. rate of acid formation. The fermentation capacity per unit time per organism decreases rapidly as growth proceeds. The generation time increases as fermentation products accumulate at const.  $p_{\text{H}}$ . A. G. P.

**Variability in activity of bacterial enzymes.** II. Factors associated with viability and growth. W. R. WOOLDRIDGE and V. GLASS (Biochem. J., 1937, 31, 526-531).—The variation in dehydrogenase activity of suspensions of washed cells of *B. coli* grown for different periods (cf. A., 1936, 897) is not associated with a variation in number or size of cells, but may be related to their viability. The activities of formic, lactic, and succinic enzymes are relatively independent of viability but those for glucose and  $\text{NH}_2$ -acids are affected by viability. During the lag phase in the growth of a bacterial

population, highly active dehydrogenase systems develop, max. activity being reached during the logarithmic phase. P. W. C.

**Bacterial growth and constituents of urine.** H. SCHONFELDER (Zentr. Bakt. Par., 1936, I, 136, 66-72).—Glycine (I) and urea, singly or in combination, cannot serve as simultaneous C and N sources for urinary organisms. The combinations  $\text{NH}_4\text{Cl}$  (II)-ketonic compounds-urea-creatinine [or cystine (III)] and (I)-(II)-urea-(III)-lactic acid did not permit growth. (II) was readily utilised by *B. coli* and *B. lactis aerogenes*, less readily by *Staphylococcus aureus* and *Enterococci*, and poorly by *S. albus* as a N source. High concns. of urea inhibit growth and saturated solutions are bactericidal.  $\text{NH}_2$ -acids containing  $>2$  C, N and C ring compounds produce free growth. Growth of the organisms was unaffected by  $p_{\text{H}}$  in the range 5.0-8.4 but ceased at 4.2 and 9.4. A. G. P.

**Action of hexamethylenetetramine on members of the colon and *aerogenes* group [of bacteria].** C. F. POE and J. H. WILLIAMSON (J. Bact., 1936, 32, 281-291).—*Aerobacter* tolerate higher concns. of  $(\text{CH}_2)_6\text{N}_4$  (I) than do *Escherichia*. Toxicity of (I)-containing media increases with time and with rise of temp. owing to the formation of  $\text{CH}_2\text{O}$ . Media containing (I) cannot be used to differentiate the two groups of organisms. A. G. P.

**Hydrogen sulphide production as a differential test in the colon group [of bacteria].** R. VAUGHN and M. LEVINE (J. Bact., 1936, 32, 65-73).—Nearly all strains of *Escherichia* and 75% of those of *Aerobacter* produce  $\text{H}_2\text{S}$  from cysteine. The application of these results to differential tests is examined. A. G. P.

**Comparison between the adsorptive action of kaolin and kaolin-alumina mixture on faecal bacteria.** W. SMITH (Lancet, 1937, 232, 438-439).—A suspension of kaolin (I) in  $\text{Al}(\text{OH})_3$  gel is a better adsorbent than an equal wt. of (I) for faecal bacteria. *B. coli* can be completely removed. Change in  $[\text{H}^+]$  or a bactericidal effect of the supernatant liquid does not explain the results. L. S. T.

**Effects of electrolytes present in growth media on electrophoretic mobility of *Escherichia coli*.** J. T. PEDLOW and M. W. LISSE (J. Bact., 1936, 31, 235-244).—The washing with  $\text{H}_2\text{O}$  of bacilli grown in peptone (I) or in (I)- $\text{CaCl}_2$  broth increases the migration velocity to a const. val. Washing organisms from (I)- $\text{Na}_2\text{SO}_4$  media at first increases and then decreases the migration velocity to the same const. val. The mobility of the organisms is not appreciably affected by the age of the culture or by changes in  $p_{\text{H}}$  during electrophoresis. A. G. P.

**Bacterial culture utilising soaps as the source of carbon.** E. POZERSKI (Compt. rend. Soc. Biol., 1937, 124, 1153-1155).—Na oleate cannot serve as a source of C for *B. coli*. H. G. R.

***B. coli* and alimentary disequilibrium.** R. LECOQ (Compt. rend. Soc. Biol., 1937, 124, 1192-1194).—Alimentary disequilibrium together with polyneuritic symptoms are observed in pigeons on a

sugar-rich diet with the addition of a high proportion of living *B. coli*, in spite of administration of yeast.

H. G. R.

**Hydrogenation of crotyl alcohol by *coli* bacteria.**—See A., II, 225.

**Bacterial fermentation and the interconversion of hexoses in alkaline solution.** A. G. WEDUM (J. Bact., 1936, 32, 175—182).—In mannose- $\text{Na}_2\text{HPO}_4$  solutions in which interconversion of hexoses had occurred (Spoehr and Strain, A., 1930, 196) there was no evidence of glucose or fructose in forms fermentable by *B. proteus* or *B. anthracis*.

A. G. P.

**Nature of the substance of the membrane of the anthrax bacillus.** G. IVANOVIC and L. ERDOS (Z. Immunitäts., 1937, 90, 5—19).—The hapten of the membrane of the anthrax bacillus is characterised as an acid having no carbohydrate or protein constituents. It resembles that in many bacilli of the *mesentericus-subtilis* group.

C. R. S.

**Cultural requirements of the fowl-coryza bacillus.** O. W. SCHALM and J. R. BEACH (J. Bact., 1936, 31, 161—169).—All strains examined, regardless of age, required both the X and V factors for growth on artificial media.

A. G. P.

**Modified tellurite medium for *Corynebacterium diphtheriae*.** J. C. KERRIN and H. W. GAZE (J. Hyg., 1937, 37, 280—285).—The substitution of sucrose for glucose and the addition of Andrade's indicator improves McLeod's and Loeffler's media.

W. L. D.

**Influence of optical activity on the utilisation of tryptophan for growth by diphtheria bacillus.** L. C. BAUGUESS (J. Bact., 1936, 32, 299—302).—For growth purposes Yu's strain of the bacillus utilises *d*-, *l*-, and *dl*-tryptophan with equal efficiency.

A. G. P.

**Cultural requirements of bacteria.** VIII. Utilisation of glutamic acid by diphtheria bacillus. J. H. MUELLER (J. Bact., 1936, 32, 207—210; cf. A., 1936, 383).—Glutamic acid can act as principal N source for the bacteria. The growth efficiency of the *dl*- is approx. 50% of that of the *d*-acid.

A. G. P.

**Purification and concentration of diphtheria toxin.** I. Evaluation of previous methods: new procedure. II. Nature of the toxin. M. D. EATON (J. Bact., 1936, 31, 347—366, 367—383).—I. The method described is based on pptn. with  $\text{NH}_4$  alum and  $\text{CdCl}_2$ .

II. With progressive purification of the toxin the ratio of N to Lf units approaches a const. val. of 0.0005 mg. of N per unit. The highly purified toxin consists mainly of a protein which is not readily pptd. by acid at any  $p_H$ , and contains no cysteine-S and little or no tryptophan.

A. G. P.

**Fermentation reactions of *Erysipelathrix rhusiopathiae*.** A. W. DEEM and C. L. WILLIAMS (J. Bact., 1936, 32, 303—306).—Of the sugars examined only fructose, glucose, galactose, and lactose were fermented by all of the 37 strains tested.

A. G. P.

**Determination of the growth factor for *Haemophilus Ducreyi*.** A. LVOV and I. PIROSKY (Compt.

rend. Soc. Biol., 1937, 124, 1169—1171).—Haemin cannot and pyridine-nucleotides (factor-V; cf. A., 1936, 1562) can be synthesised both by this organism and by *H. canis*.

H. G. R.

**Cellular reactions to waxes of *Mycobacterium leprae*.** F. R. SABIN, K. C. SMITHBURN, and R. M. THOMAS (J. Exp. Med., 1935, 62, 771—786).—The crude wax from *M. leprae* is a mixture of lipins and other materials. Cellular reaction to the wax includes the same type as that produced by tuberculo-polysaccharide, -phosphatide, and -wax. Leprosin possesses properties similar to those of the unsaponifiable matter from the tubercle bacillus. Cellular response to leprosinic acid and to the cryst. alcohols is of the same type (foreign-body giant cell).

CH. ABS. (p)

**Effectiveness of hot hypochlorites of low alkalinity in destroying *Mycobacterium tuberculosis*.** S. M. COSTIGAN (J. Bact., 1936, 32, 57—63).—The rate of destruction of the organism by the hypochlorite solution (50—200 p.p.m. of available Cl) at different temp. (50—60°) is determined.

A. G. P.

**Influence of oxygen tension on respiration of pneumococci (type I).** C. SCHLAYER (J. Bact., 1936, 31, 181—189).—Relations between respiration, growth, and  $\text{O}_2$  tension are examined.

A. G. P.

**Fermentative variability of *Shigella paradysenteriae*.** H. J. SEARS and M. SCHOOLNIK (J. Bact., 1936, 31, 309—312).—Production of variant strains differing in ability to ferment lactose, sucrose, and raffinose is described. All variants exhibit the same sp. agglutinability as does the parent organism. Differences in variants survive *S*  $\rightarrow$  *R* dissociation.

A. G. P.

**Streptococci.** I. Qualitative difference in resistance to various agents. G. H. CHAPMAN and W. B. RAWLS. II. Quantitative differences in resistance to sodium bicarbonate and hexyl-resorcinol. G. H. CHAPMAN and L. CURCIO. III. Preliminary attempts to correlate resistance to chemicals etc. with pathogenic effects. G. H. CHAPMAN, C. BERENS, and E. L. NILSON (J. Bact., 1936, 31, 323—331, 333—337, 339—346).—I. Resistance to the "bactericidal" action of dil. defibrinated guinea-pig blood is correlated with resistance to appropriate time/dilutions of  $\text{Na}_2\text{CO}_3$ ,  $\text{NaHCO}_3$  (I), hexylresorcinol (II), PhOH, basic fuchsin, etc. Reduction in nos. of viable organisms by (II) (1 : 200,000) and by 0.3% aq. (I) was similar in practically all strains examined.

II. Quant. confirmation of the action of (I) and (II) is given. The factor determining resistance of smooth strains is non-sp. Measurement of the factor is suggested.

III. Relationships are indicated.

A. G. P.

**Dismutation of pyruvic acid in *Gonococcus* and *Staphylococcus*.** H. A. KREBS (Biochem. J., 1937, 31, 661—671).— $\text{AcCO}_2\text{H}$  reacts anaerobically in *Gonococcus*, *S. aureus*, *S. albus*, and *Streptococcus faecalis*, yielding lactic acid,  $\text{AcOH}$ , and  $\text{CO}_2$ . The rate of dismutation is increased (up to 10 times) in *S. aureus* and *Strep. faecalis* by addition of boiled yeast extract, the activating effect of which is probably due

to a mixture of substances, since no individual compound tried (Warburg's yellow enzyme and co-enzymes etc.) had as great an effect. Succinic acid is a by-product (1—2%) of the anaerobic metabolism of  $\text{AcCO}_2\text{H}$ . P. G. M.

**Nicotinic acid and the growth of *Staphylococcus aureus*.** B. C. J. G. KNIGHT (Nature, 1937, 139, 628).—One of the growth factors present in the high-vac. distillate of yeast extract, which enables *S. aureus* to be grown on a special medium, can be replaced by nicotinic acid, prepared in different ways, or more effectively by its amide. L. S. T.

**Relation between the chemical constitution of the somatic antigen and the Gram-staining of the bacteria.** A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 1176—1179).—Only sp. polysaccharides could be demonstrated with Gram-positive organisms, whilst with Gram-negative the sugar-lipin complex was present. H. G. R.

**Lysogenic modification of bacteria.** G. PROCA (Compt. rend. Soc. Biol., 1937, 124, 981—983).—Active filtrates contain at least two factors, a growth factor and a bacteriolysin. H. G. R.

**Determination of reducing sugars in bacterial cultures. Colorimetric methods.** D. KLEMME and C. F. POE (J. Bact., 1936, 32, 1—9).—Seven methods are compared. The Lewis-Benedict and to a smaller extent the Folin and Folin-Wu methods give high results in some cases, probably because other reducing substances are formed during bacterial growth. The Sumner, Folin-Wu, and dinitrophenol methods give best results for residual sugar in cultures. Fuller's earth, starch, norite, and basic Pb acetate, but not  $\text{Hg}(\text{NO}_3)_2$ , are effective clarifying agents for media prior to sugar determinations.  $\text{Al}_2\text{O}_3$  cream is suitable when any but the Lewis-Benedict method is to be used. Sufficiently accurate results are generally obtainable without clarification. A. G. P.

**Detection of nitrate reduction [by bacteria].** H. J. CONN (J. Bact., 1936, 31, 225—233).—Methods for examining cultures for  $\text{NO}_2'$ ,  $\text{NH}_3$ , or N produced from  $\text{NO}_3'$  and the significance of these tests are discussed. A. G. P.

**Role of bacteria in autolysing tissue.** J. R. REEVES and H. E. MARTIN (J. Bact., 1936, 31, 191—202).—Digests of fresh hog and ox liver contain resistant strains of sporing organisms which are not inhibited by changes in  $p_{\text{H}}$  or by customary germicides and preservatives. The possible influence of these organisms on the autolysis of digests is discussed. A. G. P.

**Bacterial pigmentation. I. Historical considerations.** R. D. REID (J. Bact., 1936, 31, 205—210). A. G. P.

**Bacterial pigmentation. II.** R. D. REID (Zentr. Bakt. Par., 1937, II, 95, 379—389).—The principal factor influencing pigmentation in a no. of species of bacteria is the amount and availability of the N supply. Starch and sugar increase pigmentation (probably by increasing general growth) when adequate N is available but have no influence

in the absence of N. Pigment formation is optimum at  $p_{\text{H}}$  6.6—8.0 and is not facilitated by organo-metallic compounds. A. G. P.

**Changes in hydrogen-ion concentration of uninoculated nutrient broth during sterilisation and storage.** K. HEICKEN (Zentr. Bakt. Par., 1936, I, 135, 513—521).—The  $p_{\text{H}}$  of broth tends to change towards neutrality during sterilisation and storage, the effect being most marked initially in highly alkaline preps. The change is attributed to  $\text{CO}_2$  of the atm. A. G. P.

**Improved [bacteriological] laboratory apparatus.** J. C. WILLETT (Amer. J. Publ. Health, 1937, 27, 346—348).—A Pb-lined tank and perforated Pb sheet baskets for acid cleaning of infected glassware and appropriate apparatus for a diphtheria outfit are described. W. L. D.

**Inactivation of a bacteriophage by immune serum and by bacterial polysaccharide.** F. M. BURNET and M. FREEMAN (Austral. J. Exp. Biol., 1937, 15, 49—61).—A variant of Morison's type phage H showed, in addition to relative inability to be adsorbed by susceptible bacteria, no sensitivity towards inactivation by phage-inhibiting agent (I), increased heat-sensitivity, slightly increased susceptibility to inactivation by antiserum, and a higher titre in broth cultures. Phage H when treated with <inactivating amounts of antiserum showed decreased susceptibility to (I). Inactivation of phage H by (I) did not decrease its power to coat bacteria, nor affect its direct agglutination by antiphage serum. Results are discussed in terms of "active groups" on the phage surface. J. N. A.

**Characteristics of the lysin precipitable by alcohol in bacteriophagic lysates.** I. LOMINSKI (Compt. rend. Soc. Biol., 1937, 124, 1068—1071).—With a modification of d'Herelle's technique, a bactericidal substance (I) (not a true lysin) has been prepared from a bacteriophage. (I) is activated by certain concns. of a bacterial suspension and has a zone of optimum activity. H. G. R.

**Air-borne plant virus.** K. M. SMITH (Nature, 1937, 139, 370). L. S. T.

**Liquid crystalline preparations of cucumber viruses 3 and 4.** F. C. BAWDEN and N. W. PIRIE (Nature, 1937, 139, 546—547; cf. this vol., 71).—Nucleoproteins of composition and properties similar to those obtained from solanaceous plants infected with tobacco mosaic virus have been isolated from cucumber plants infected with cucumber viruses 3 and 4. Infections of cucumber plants were obtained with  $10^9$  g. of these nucleoproteins and sp. ppts. with antiserum were obtained with  $\frac{1}{2} \times 10^{-6}$  g. No infections of tobacco, tomato, *Nicotiana glutinosa*, or Golden Cluster beans could be produced. Differences in properties of these viruses from those of the tobacco mosaic virus are pointed out. The cucumber and tobacco viruses are serologically related, and only preps. thus related to tobacco mosaic virus show anisotropy of flow and form spontaneously birefringent solutions. L. S. T.

**Crystalline tobacco-mosaic virus.** W. M. STANLEY (Amer. J. Bot., 1937, 24, 59—68).—A lecture. The protein character of the virus is discussed.

A. G. P.

**Visible mesomorphic fibres of tobacco mosaic virus in juice from diseased plants.** R. J. BEST (Nature, 1937, 139, 628—629; cf. this vol., 71).—Fibres are formed in the juice of mosaic-diseased tobacco plants after clarification by centrifuging and storage at  $\sim 1^\circ$  for several months. The collapse of the fibres at the temp. of thermal inactivation of the virus, and other properties, indicate that the fibres constitute the virus or contain the virus as an essential constituent. These mesomorphic, flexible fibres probably consist of long chains of virus particles linked together by relatively weak linkings.

L. S. T.

**Isolation of tobacco ring spot and other virus proteins by ultracentrifugation.** W. M. STANLEY and R. W. G. WYCKOFF (Science, 1937, 85, 181—183).—A cryst. protein of high mol. wt., sedimentation const.  $\sim 115 \times 10^{-13}$  cm. per sec. per dyne, possessing the properties of ring spot virus and differing from tobacco mosaic virus protein in physical, chemical, and serological properties, has been isolated by ultracentrifuging from Turkish tobacco plants with ring spot virus. Proteins of high mol. wt. are also shown by this means to be characteristic of latent mosaic of potato, severe etch, and cucumber mosaic viruses. The concns. of these different virus proteins in diseased Turkish tobacco plants show large differences.

L. S. T.

**Adsorption of the sheep-pox virus on kaolin and animal charcoal.** N. STAMATIN (Compt. rend. Soc. Biol., 1937, 124, 984—986).—Animal C is the better adsorbent, preferably used in an acid medium. Kaolin has no affinity for the virus.

H. G. R.

**Recently-isolated strain of poliomyelitic virus.** B. F. HOWITT (Science, 1937, 85, 268—270).—This strain possesses certain immunological properties combined with a slight difference in tissue reactions which suggest that not all strains of poliomyelitic virus are quantitatively or even qualitatively similar.

L. S. T.

**Relation of certain viruses to the active agent of the Rous chicken sarcoma.** J. W. JOBLING and E. E. SPROUL (Science, 1937, 85, 270—271).—Lipin extracts of the vaccinia and the tobacco mosaic viruses failed to reproduce disease, and are thus distinguished from the active, lipin fraction of the Rous chicken sarcoma.

L. S. T.

**Effect of radium on bacteria.** R. R. SPENCER (U.S. Publ. Health Repts., 1935, 50, 1642—1655).—The killing effects of  $\beta$ - and  $\gamma$ -rays are compared. Irradiation of bacteria may induce cultural and morphological changes.

CH. ABS. (p)

**Action of ultra-violet light on spores and vegetative forms of *B. megatherium* sp.** F. HERČÍK (J. Gen. Physiol., 1937, 20, 589—594).—The killing rate of both spores and vegetative forms of a strain of *B. megatherium* sp., after irradiation by ultra-violet light, is exponential. Twice as much incident energy is needed to kill the spores as the

vegetative forms. The absorbed energy per bacterium for 50% killing is calc.

E. A. H. R.

**Oligodynamic action of silver.** I. J. HEISS (Biochem. Z., 1937, 290, 99—103).—Ag wire placed in cultures of *Staphylococcus aureus* can be rendered oligodynamically active by contact with various activators, e.g., AgCl, AgNO<sub>3</sub>, Ag<sub>2</sub>O, CuCl<sub>2</sub>.

P. W. C.

**Is there a parallelism between the trypanocidal and the spirochaetocidal effect of arsenobenzene compounds?** I. VON VASARHELYI (Z. Immunitäts., 1937, 90, 19—28).—The relative trypanocidal effects of two arsenobenzene preps. were paralleled by their action on experimental syphilis in rabbits.

C. R. S.

**Dissociation *in vivo* and *in vitro* of the bactericidal action of 8-hydroxyquinoline sulphate.** M. AITOFF (Compt. rend. Soc. Biol., 1937, 124, 949—951).—The sulphate shows no anti-staphylococcal action in the rabbit on subcutaneous or intravenous injection.

H. G. R.

**Increase in blood-lactic acid in the horse due to adrenaline.** L. BLANCHARD (Compt. rend. Soc. Biol., 1937, 124, 944—946).—Small intravenous doses of adrenaline increase blood-lactic acid and -sugar by 61.24 and 43.19%, respectively, the effect disappearing 4 hr. after the injection.

H. G. R.

**Diathermy and secretion of adrenaline.** J. MICHEZ (Compt. rend. Soc. Biol., 1937, 124, 1006—1008).—Secretion of adrenaline in the dog is not affected by general diathermy but is increased when localised in the lumbar region.

H. G. R.

**Synergism of adrenaline and pituitary hormone. Adrenaline glycogenolysis.** L. KEPINOV (Compt. rend., 1937, 204, 808—810).—Glycogenolysis does not occur when adrenaline (I) is added to the Locke-Tyrode solution after perfusion of frog's liver for  $>4$  hr. Addition of fresh extracts of normal liver or muscle restores the glycogenolytic action of (I).

F. O. H.

**Extracts containing cortin.** F. A. HARTMAN and W. D. POHLE (Endocrinol., 1936, 20, 795—800).—Cortin (I) can be extracted from the adrenal cortex by COMe<sub>2</sub>, C<sub>6</sub>H<sub>6</sub>, Et<sub>2</sub>O, or EtOH, EtOH giving the best yield. Et<sub>2</sub>O and EtOAc are better solvents than C<sub>6</sub>H<sub>6</sub> and CHCl<sub>3</sub> for purification. An aq. extract can be prepared from the EtOH extract by alternate extractions with Et<sub>2</sub>O and dil. EtOH, each solvent being distilled off *in vac.*, and the final residue taken up with H<sub>2</sub>O. A glycerol (II) extract containing very little adrenaline is prepared by extraction with (II), pptn. with EtOH, filtration through crystallite, and removal of the EtOH. NaCl in the diet of adrenalectomised cats reduces their (I) requirements. The cat unit of (I) is defined.

R. N. C.

**Effects of anterior pituitary extract and certain environmental conditions on the genital system of the horned lizard.** C. H. MELLISH (Anat. Rec., 1936, 67, 23—33).

R. N. C.

**Tumour growth in hypophyseal dwarfism.** B. ZONDEK (Lancet, 1937, 232, 689—690).—Malignant tumours implanted in hypophyseal dwarf rats

grow as fast as those implanted in controls, showing that the growth hormone of the anterior pituitary has no important effect on the growth of malignant tumours.

L. S. T.

**Comparative action of pituitary extracts and of gonadotropic substances of the urine on ovulation in *Rana temporaria*.** L. GALLIEN (Compt. rend. Soc. Biol., 1937, 124, 874—877).—Extracts prepared from urine of pregnancy are inactive, those obtained by extraction of ox pituitary gland with aq. NaCl are very active but not well tolerated by the animal, whilst excellent results are given by alkaline extracts of ox- or aq. NaCl extracts of frog-pituitary. The no. of eggs ovulated  $\propto$  the dose injected.

H. G. R.

**Urinary excretion of gonadotropic hormone in cryptorchidism.** J. H. HESS, R. H. KUNSTADTER, and W. SAPHIR (J. Amer. Med. Assoc., 1937, 108, 352—354).—Significant amounts of the hormone appeared in the urine in 5 out of 13 cases. The clinical significance of the phenomenon is discussed.

R. M. M. O.

**Hypophyseal gonadotropic hormones and the luteinisation phenomenon in the rat.** C. A. PFEIFFER (Anat. Rec., 1937, 67, 159—175).

R. N. C.

**Changes in the action of ovarian hormone and of the gonadotropic fraction of the anterior pituitary effected by disturbance of the acid-base equilibrium.** K. A. BOCK (Klin. Woch., 1935, 14, 1750—1753; Chem. Zentr., 1936, i, 2963).—Acidity in the tissue intensifies and alkalinity weakens the action of folliculin and prolan.

A. G. P.

**Relation of the posterior pituitary to water exchange in the cat.** W. R. INGRAM and C. FISHER (Anat. Rec., 1936, 66, 271—288).—Permanent polyuria results from complete removal of the stalk if the anterior lobe is left intact.

R. N. C.

**Evaluation of the potency of oestrogenic substances.** S. C. FREED and S. SOSKIN (Endocrinol., 1936, 20, 863—864).

R. N. C.

**Effect of oestrogenic substances on the pituitary, adrenals, and ovaries.** E. T. ELLISON and J. C. BURCH (Endocrinol., 1936, 20, 746—752).

R. N. C.

**Relative duration of action of various esters of oestrone, oestradiol, and oestriol.** A. S. PARKES (Biochem. J., 1937, 31, 579—585).—The duration of action of various esters of oestrone (I), oestradiol (II), and oestriol (III) is determined in terms of feminisation of the growing plumage of Brown Leghorn capons. Even massive doses of the free hormones given as a single injection have only a transient effect. The acetate of (I) is scarcely more effective. The diacetate and benzoate of (II) and the benzoate of (I) show increasingly prolonged activities without loss of intensity. The 3-benzoate 17-acetate of (II) shows prolonged activity with slight loss of intensity. The dibenzoate of (II) has a very low intensity but large doses may have a prolonged action. The triacetate of (III) has a low intensity and a transient effect.

P. W. C.

**Cyclical fluctuations in oestrin threshold.** S. ZUCKERMAN (Nature, 1937, 139, 628).—The threshold of a rhesus monkey to oestrogenic stimulation appears to vary in a cyclical manner, and the rhythmical rise in the oestrone threshold is due either to the cyclical liberation into the blood stream of a substance that neutralises oestrone or to an inherent cycle of the tissues.

L. S. T.

**Simple aromatic oestrogenic agent with an activity of the same order as that of oestrone.** E. C. DODDS and W. LAWSON (Nature, 1937, 139, 627—628).—*p*-Hydroxypropenylbenzene is such an agent. Its benzoate, m.p. 124°, is also active. The oestrogenic activities of other relatively simple org. substances not containing the phenanthrene nucleus are tabulated.

L. S. T.

**Quantitative study of the anti-oestrogenic action of progestin, using crystalline hormones.** R. COURRIER and G. COHEN-SOLAL (Compt. rend. Soc. Biol., 1937, 124, 961—964).—The concn. of progestin must be 200—400 times that of folliculin.

H. G. R.

**Human corpus luteum and progestin. II.** J. P. PRATT, E. C. HAMBLEY, O. KAMM, and D. A. MCGINTY (Endocrinol., 1936, 20, 741—745).—About 40 human corpora lutea yield one rabbit unit of progestin.

R. N. C.

**Follicular hormone and ovulation inhibition.** G. DAHLBERG (J. Obstet. Gynaecol. Brit. Empire, 1935, 42, 953—961).—The Zondek-Aschheim reaction is probably due to the fact that follicular hormone (I) is resorbed and consumed more quickly than is prolan. Hence the action of the latter predominates. The high % of (I) in mice is not continuously high enough to prevent ovulation.

CH. ABS. (*p*)

**Synthesis of the female ovarian hormone "folliculosterone."**—See A., II, 251.

**Esters of the follicle hormone series.**—See A., II, 199.

**Endocrines in theory and practice. Chemistry and assay of male hormones.** R. K. CALLOW and A. S. PARKES (Brit. Med. J., 1937, 456—458).—A review.

A. G. P.

**Preparation of  $\Delta^5$ -3-epihydroxy-17-trans-hydroxyandrostene and 3-epihydroxy-17-trans-hydroxyætiocolane.**—See A., II, 243.

**Hormones of the androsterone group.**—See A., II, 251.

**Sterol ketones and sexual hormones. Sterols. VIII—XIII.**—See A., II, 250.

**Relation between site of injection of androsterone and the comb response of the fowl.** A. W. GREENWOOD and J. S. S. BLYTH (Quart. J. Exp. Physiol., 1935, 25, 267—277).—Direct injection into capon's comb produced greater response than intramuscular injection in the pectoral region. Females showed less response than capons. Incompletely castrated males gave a marked and normal males no response.

CH. ABS. (*p*)

**Relation between testosterone and folliculin. Quantitative study of their antagonism.** R. COURRIER and G. COHEN-SOLAL (Compt. rend. Soc.

Biol., 1937, **124**, 925—928).—Testosterone acetate has no oestrogenic action in the castrated female but, like progesterone, antagonises the action of dihydrofolliculin on the vaginal epithelium if present in a 25-fold greater quantity. H. G. R.

**Effect of testosterone propionate on mating.** H. A. SHAPIRO (Nature, 1937, **139**, 588—589).—Administration of testosterone propionate to rats castrated before the beginning of sexual behaviour induces mating. L. S. T.

**Hormonal stimulation of spermatogenesis in the testis of the ground squirrel.** L. J. WELLS and C. R. MOORE (Anat. Rec., 1936, **66**, 181—200). R. N. C.

**Effect of insulin on the blood-sugar during perfusion of the liver.** N. FIESSINGER, H. BÉNARD, M. HERBAIN, L. DERMER, and G. BAREILLIER (Compt. rend. Soc. Biol., 1937, **124**, 952—954).—Of 6 samples of insulin, 3 produced hyperglycaemia and 3 were without action on the blood-sugar (dogs). H. G. R.

**Post-insulin blood-sugar after ligation of the pancreatic duct in dogs with glandular hyperfunction.** P. HOUSSA (Compt. rend. Soc. Biol., 1937, **124**, 1252—1254).—The lowering of the blood-sugar by insulin is decreased if the pancreas (with ligatured duct) is stimulated by secretin. This is most marked 6—12 days after the ligaturing. H. G. R.

**Protamine and insulin in the treatment of diabetes mellitus.** I. M. RABINOWITCH, A. F. FOWLER, and A. C. CORCORAN (Canad. Med. Assoc. J., 1936, **35**, 124—129).—Protamine insulinate (I) keeps well and should be allowed to age for <5 days before use. Doses of 50 units of (I) decrease the blood-sugar to 0.06% but cause no hypoglycaemia in healthy individuals. In some diabetic patients on diets high in carbohydrate, the disease is controlled by one daily injection of 40—100 units of (I). NUTR. ABS. (*m*)

**Protamine insulin versus ordinary insulin.** A. SIDONI, jun. (J. Amer. Med. Assoc., 1937, **108**, 1320—1327).—Ordinary insulin should be administered with protamine insulin since the latter is unable to oxidise the rapidly absorbed glucose in the diet. Fasting blood-sugar determinations should be supplemented by others 2 hr. after the meal. H. G. R.

**Antigenic properties of insulin.** J. H. LEWIS (J. Amer. Med. Assoc., 1937, **108**, 1336—1338).—Insulin is an active antigen without species specificity, its specificity being independent of that of the major constituents of the pancreas. Samples from different animals are closely related immunologically. H. G. R.

**Hypophysectomy and the urinary excretion of phosphorus.** L. BRULL (Compt. rend. Soc. Biol., 1937, **124**, 1242—1244).—The renal threshold of the dog for inorg. P, previously lowered by parathyroid hormone, is raised by hypophysectomy. H. G. R.

**Physiology of mammary development and lactation.** S. A. ASDELL, H. J. BROOKS, G. W. SALISBURY, and H. R. SEIDENSTEIN (Cornell Univ. Agric. Exp. Sta. Mem., 1936, No. 198, 32 pp.).—NaOH extracts of anterior sheep pituitary caused

mammary growth and secretion in virgin ovariectomised rabbits but did not affect immature male or female animals. Acid extracts did not affect mammary growth but induced lactation in dry parous ovariectomised rabbits. The active substance, prolactin (I), is relatively stable. Mammary growth and secretion are probably caused by different hormones. No oestrin occurred in urine of pregnant rabbits. Ovarian hormones probably affect mammary development directly and not through the pituitary. Injection of (I) into female goat kids induced milk secretion. Injection late in the lactation period of goats increased milk yields only when made at the stage of min. production and had no effect just after peak production. A. G. P.

**Prolactin in mare's serum during pregnancy and lactation.** C. P. LEBLOND (Compt. rend. Soc. Biol., 1937, **124**, 1062—1063).—Only traces of prolactin were found. H. G. R.

**Detection of prolactin (lactogenic hormone of the pituitary gland).** C. P. LEBLOND and E. ALLEN (Compt. rend. Soc. Biol., 1937, **124**, 1190—1191).—After intramuscular injection of prolactin into pigeons, cell-mitosis can be observed within 10 hr. in the crop, previous injection of colchicine having arrested the metaphase. H. G. R.

**Sinus glands and hormonally controlled pigment metabolism of Crustacea.** B. HANSTROM (Kungl. Svenska Vetens. Handl., 1937, **16**, No. 3, 97 pp.).—*Decapoda* contain a pigment-activating principle (I) produced generally in the optic pedicles, occasionally in the cephalic region. (I) appears to be related to sinus glands occurring in the species investigated. The hormonal character of (I) and its function in pigmentation phenomena in *Crustacea* are discussed. F. O. H.

**Influence of vitamin-A, -B, and -D, anaemia, and fasting on the rate of fat absorption in rats.** M. H. IRWIN, H. STEENBOCK, and A. R. KEMMERER [with J. WEBER] (J. Nutrition, 1936, **12**, 357—364).—Fat absorption was subnormal in avitaminosis-A, -B, and -D, in anaemia, and during fasting. Addition of the vitamins did not affect fat absorption in normal animals. The rate of fat absorption is influenced by the general nutritional state of an animal and may not be affected specifically by the vitamin supply. A. G. P.

**Composition and vitamin studies of green soya beans.** C. D. MILLER and R. C. ROBBINS (Hawaii Agric. Exp. Sta. Rept. [1933], 1934, 24—25).—The cooked beans (analyses recorded) are good sources of vitamin-A and -B<sub>1</sub> for rats and also contain -B<sub>2</sub>. CH. ABS. (*p*)

**Significance of beer yeast as a source of vitamins.** F. HARREIS and H. SCHNEIDER (Woch. Brau., 1937, **54**, 116—117).—The importance of brewery yeast as a source of the vitamin-B complex and of ergosterol, and the physiological effects of -B and -D, are discussed. Irradiated yeast can cause no ill-effects in the human body, the effects of excessive amounts of -D being apparently neutralised by -B and/or glutathione. I. A. P.

**Detection of vitamin-A, -C, and -D.** R. WAIT (Pharm. Zentr., 1937, 78, 237—238).—Vitamin-A and -C produce a blue and -D a green colour when treated with a 1% solution of phosphomolybdic acid in AcOH. The reaction is sp. for the vitamins and if both -A and -D are present the green colour appears first and changes to blue. Aq. phosphotungstic acid is suggested as a reagent for the detection of -C; a blue colour is produced. E. H. S.

**Fish-liver oils and vitamins.**—See B., 1937, 464.

**Colloidal solutions of carotene (pro-vitamin-A).** A. RATSCHESKI (Z. Vitaminforsch., 1937, 6, 113—116).—Carotene (I) is dissolved in CS<sub>2</sub>, COMe<sub>2</sub> [0.5—1.0 c.c. per mg. of (I)] is added, and the solution conc. at 100° until the residue gives a homogeneous colloidal solution [containing up to 0.2% of (I)] on addition of H<sub>2</sub>O. F. O. H.

**Vitamin-A and the visual function and phototropism of chickens.** A. V. PLETNJEV (Z. Vitaminforsch., 1937, 6, 140—149).—The reaction of chickens to various light stimuli is related to the amount of vitamin-A in their food. The bearing of this phototropism on the concn. of visual purple in the retina (cf. Wald, A., 1934, 913) and the possibility of using the phenomenon as a basis for testing -A preps. are discussed. F. O. H.

**Vitamin-A and fat metabolism.** N. K. BASU (Z. Vitaminforsch., 1937, 6, 106—110).—Vitamin-A is not absorbed from the intestine of rats unless the diet contains a suitable (*i.e.*, unsaturated) fat or oil. This finding vitiates various theories (*e.g.*, that of Becker, A., 1934, 1251) of the role of unsaturated acids in nutrition. F. O. H.

**Diagnosis of hypovitaminosis-A and -C by determination of the concentration of vitamin-A and -C in the blood.** M. VAN EEKELN, A. EMMERIE, and L. K. WOLFF (Z. Vitaminforsch., 1937, 6, 150—162).—Methods of determining vitamin-A (Eekelen, A., 1936, 646) and -C (*ibid.*, 255) in blood are described. Hypovitaminosis-C is diagnosed by determining the amount of -C required to be administered before blood-saturation is reached. In determining -A in blood by means of SbCl<sub>3</sub>, consideration must be given to carotenoids present. F. O. H.

**Change in weight produced by the growth hormone in avitaminotic rats.** E. MARGITAY-BECHT and E. WALLNER (Z. Vitaminforsch., 1937, 6, 119—125).—With rats of approx. const. wt. due to avitaminosis-A, administration of an alkaline extract of anterior pituitary lobe (A., 1934, 1144) produces no resumption of growth; hence avitaminosis-A is not related to pituitary function. F. O. H.

**Determination of vitamin-A.** E. M. HUME (Nature, 1937, 139, 467—468).—A preliminary report of the results obtained by the Accessory Food Factors Committee on vitamin-A standards. The factor found with halibut-liver oil for converting the results of spectroscopic tests into international units is 1470 with a range of 1400—1700. The val. 1600 previously recommended by the International Conference of 1934 is retained. Apparent discrepancies with con-

centrates are probably due to unsuspected deterioration in the course of biological tests. L. S. T.

**Iodometric determination of vitamin-A.** V. SOLJANIKOVA-NIKOLSKAJA (Z. Vitaminforsch., 1937, 6, 117—119).—Titration of colloidal solutions (0.0015—0.005%) of a vitamin-A concentrate in H<sub>2</sub>O with 0.01N-I gives results approx.  $\propto$  the Carr-Price "blue unit" vals. F. O. H.

**Vitamin-A, -B<sub>1</sub>, and -B<sub>2</sub> content of raw and cooked yolk of hen's egg.** L. DE CARO and A. LOCATELLI (Quad. Nutrizione, 1936, 3, 187—191).—Hen's egg-yolk contains per g. when raw, 88 international units of vitamin-A and 1 of -B<sub>1</sub> and, after 5—7 min. at 100°, 55 -A and 1 -B<sub>1</sub>. The content of the -B<sub>2</sub> complex is 4 biological units per g. for both cooked and raw egg-yolk. NUTR. ABS. (m)

**Vitamin-B<sub>1</sub> and carbohydrate metabolism.** H. G. K. WESTENBRINK (Chem. Weekblad, 1937, 34, 246—249).—The relationship between the phenomena of vitamin-B<sub>1</sub> deficiency and those of carbohydrate metabolism in muscle and yeast is discussed. S. C.

**Antineuritic potency of synthetic and natural crystalline vitamin-B<sub>1</sub> determined by the "bradycardia" method.** P. C. LEONG and L. J. HARRIS (Biochem. J., 1937, 31, 672—680).—Specimens of natural and synthetic cryst. vitamin-B<sub>1</sub> have a potency of 2.8—3.0  $\times 10^{-6}$  g. per international unit. A statistical analysis of the accuracy of the method has been made. P. G. M.

**Beriberi and vitamin-B<sub>1</sub> deficiency.** B. S. PLATT and G. D. LU (Quart. J. Med., 1936, 5, 355—373).—The concn. of substances (I) which bind HSO<sub>3</sub>' in body fluids (AcCO<sub>2</sub>H, AcCHO) is used as criterion in the diagnosis of beriberi and other diseases involving deficiency of vitamin-B<sub>1</sub>. Methods of determining (I) in blood, urine, and cerebrospinal fluid are given. In acute fulminating beriberi and also (slightly) in the subacute form, in those cases with most marked symptoms but not in the less severe ones the (I) content of the blood was increased. -A deficiency was sometimes present as a complication. NUTR. ABS. (m)

**Blood-guanidine in experimental beriberi.** A. PIANA (Pediatria, 1936, 44, 127—133).—In pigeons with beriberi, no important variations in the guanidine content of the blood are detected. NUTR. ABS. (m)

**Preparation and chemical investigation of vitamin-B<sub>1</sub>.** H. KAKEFUDA (Fukuoka Ikwad. Zasshi, 1934, 27, 1849—1899).—To the Ag fraction of extracts of rice embryo is added PtCl<sub>4</sub> or picric acid and subsequently AuCl<sub>3</sub>. By means of the COMe<sub>2</sub>-EtOH combination method cryst. -B<sub>1</sub> was obtained. The protective dose for rats was 0.01 mg. and for pigeons 0.00258 mg. daily. On electrolysis -B<sub>1</sub> accumulates at the cathode. It contains S but no NH<sub>2</sub>-N and gives a strong diazo-reaction. Activity is destroyed by ultra-violet but not by X-rays. CH. ABS. (p)

**Accumulation of vitamin-B<sub>1</sub> in the animal organism.** N. S. JARUSOVA (Z. Vitaminforsch., 1937, 6, 98—106; cf. A., 1936, 529).—The incidence of avitaminosis-B<sub>1</sub> in pigeons on a -B<sub>1</sub>-free diet is

delayed by previous ingestion of large doses of  $-B_1$ ; hence storage of  $-B_1$  occurs in the body.

F. O. H.

**Variation in the vitamin- $B_1$  activity of raw wheat germ.** A. Z. BAKER and M. D. WRIGHT (J. Hyg., 1937, 37, 303—306).—The units of  $-B_1$  per g. vary from 4 to 22.

W. L. D.

**Reagent for vitamin- $B_1$ .** B. NATMAN (Science, 1937, 85, 290).—A solution of  $\text{BiI}_3$  in KI gives a characteristic orange-red ppt. with certain vitamin- $B_1$  products.

L. S. T.

**Relation of vitamin- $B_2$  to hatchability of hens' eggs.** R. M. BETHKE, P. R. RECORD, and D. C. KENNARD (J. Nutrition, 1936, 12, 297—307).—Inclusion of lucerne leaf meal, dried liver, or wheat germ in the ration improves the hatchability of eggs. The active substance in liver is  $\text{H}_2\text{O}$ -sol. and is destroyed by autoclaving with alkali but not with acid. It is probably vitamin- $B_2$ .  $-B_1$  and  $-E$  are not concerned in hatchability.

A. G. P.

**Effect of the ration of the hen on the vitamin- $B_2$  content of eggs: distribution of vitamin- $B_1$  and  $-B_2$  in normal eggs.** R. M. BETHKE, P. R. RECORD, and F. W. WILDER (J. Nutrition, 1936, 12, 309—320).—Vitamin- $B_1$  occurs in yolk but not in white of egg.  $-B_2$  is present in yolk and white in amounts which  $\propto$  the proportion in the ration. Embryonic development of the egg is influenced by its  $-B_2$  content.

A. G. P.

**Synthesis of flavin glucosides.**—See A., II, 231.

**Vitamin-C technique as a contribution to cytology.** G. BOURNE (Anat. Rec., 1936, 66, 369—385).

R. N. C.

**Vitamin-C and diphtheria toxin.** A. SIGAL and C. G. KING (J. Pharm. Exp. Ther., 1937, 59, 468—473).—Buffered ( $p_H$  6.4—7.4) solutions of the vitamin do not inactivate the toxin *in vitro* but the acidity of unbuffered solutions causes a not readily reversible inactivation.

W. McC.

**Effect of ascorbic acid on constituents of blood.** P. CIATTI and R. AUERBACH (Riv. Clin. Pediat., 1936, 34, 385—391).—In the serum of guinea-pigs scurvy causes an increase in total protein (I), a slight decrease in crystalloids, and a very slight increase in  $\text{H}_2\text{O}$  content. The increase in (I) is confined to the globulin (II); the albumin (III) decreases and the (I) quotient falls to 1.4. Administration of ascorbic acid to healthy guinea-pigs produces a slight decrease in (II) and a marked increase in (III).

NUTR. ABS. (m)

**Storage of vitamin-C by normal adults following a period of low intake.** P. H. O'HARA and H. M. HAUCK (J. Nutrition, 1936, 12, 413—426).—2200—2800 mg. of vitamin-C administered at the rate of 200 mg. daily was necessary to saturate the tissues after feeding a deficient diet for a month. Differences between intake and excretion during the replenishment period indicate a max.  $-C$  reserve of 2500—3000 mg.

A. G. P.

**Duality of oxidised forms and polarisation of vitamin-C indicated by the two reversible re-**

**actions with phosphomolybdic acid.** N. BEZSONOFF and M. WOŁOSZYN (Compt. rend., 1937, 204, 819—821).—With phosphomolybdic acid (I), aq. ascorbic acid (II) yields blue and green solutions with  $E_h$  of 490 and 526 mv., respectively; this and the reactions of (I) with pyrocatechol and quinol do not support the dienol structure of (II), the constitution of which is discussed.

F. O. H.

**Enzymic oxidation of ascorbic acid.** V. A. ENGELHARDT and V. N. BUKIN (Biochimia, 1937, 2, 274—292).—Ascorbic acid oxidase (I) from cabbage leaves exhibits optimal activity at  $p_H$  5.5—5.9. The amount of ascorbic acid (II) oxidised by (I) is independent of the (II) concn. probably because (I) acts indirectly, the limiting factor being the production of an intermediate compound which subsequently acts as H acceptor in the dehydrogenation of (II). The dehydrogenation is a reaction of zero order. CO in concns.  $>95\%$  does not inhibit the action of (I). Phenolase (III) alone does not attack (II) but oxidises it rapidly in presence of pyrogallol (IV), the reaction being unimol. Here the rate of dehydrogenation of (II) by the quinone produced is  $<$  the rate of oxidation of (IV) by (III) and is the limiting factor. The (II) system is not invariably involved in the respiration of plant tissues although in some cases the system could deal with all the H oxidised during respiration.

W. McC.

**Oxidation of ascorbic acid (vitamin-C) in plants.** M. GUDLET and E. KARDOSOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 307—311).—Plant tissue is comminuted, extracted with  $\text{H}_2\text{O}$ , and titrated by Tillmans' method before and after passage of  $\text{H}_2\text{S}$  and subsequently of  $\text{O}_2$ , all operations (except the last) being performed in  $\text{CO}_2$ . The contents of ascorbic acid (I), its convertible (II) and inconvertible (III) oxidised form in horse radish and dog rose are thus determined. Dog rose contains an enzyme which catalyses oxidation of (I) to (II), but not to (III); apple and horse-radish contain enzymes which catalyse both oxidations. The solid parts of the plant contain an enzyme which catalyses the change, (I)  $\rightarrow$  (III); the aq. extract contains a second enzyme, which catalyses only the reaction, (I)  $\rightarrow$  (II). Low and high (I) or (II) content of plants is in general correlated with presence or absence, respectively, of the enzymes. The presence of much (I) and (II) in horse-radish is due to inability of  $\text{O}_2$  to permeate the cell walls and to the occurrence of the vitamin and enzymes in separate cells; after comminution the vitamin rapidly disappears.

R. S. C.

**Oxidase systems of peroxidase plants.** A. SZENT-GYORGYI (Biochimia, 1937, 2, 151—153).— $\text{H}_2\text{O}_2$  added to the system peroxidase (I)—ascorbic acid (II)—ascorbic acid oxidase (III) slowly oxidises (II) but has no other effect. If (I) and (III) are replaced by raw fruit juice, (I) of the juice rapidly oxidises (II). Hence the juice contains a substance which catalyses the oxidation of (II) by (I). Flavones (IV) which contain the group  $o\text{-C}_6\text{H}_3(\text{OH})_2$  also specifically catalyse the oxidation, which proceeds thus: O, with (III) dehydrogenates (II) yielding an equiv. amount of  $\text{H}_2\text{O}_2$  which, with (I), oxidises (IV) to the correspond-

ing quinones; these oxidise (II) and oxidised (II) is then reduced by activated H in the medium.

W. McC.

**Stability of ascorbic acid in urine and in aqueous solution. Effect of conditions in the urinary tract.** H. LUND and H. LIECK (Skand. Arch. Physiol., 1936, 74, 255—268).—The stability of ascorbic acid (I) in urine is determined by its  $O_2$  tension and reaction. If the urine is alkaline, neutral, or slightly acid, oxidation of (I) may occur in the urinary tract before excretion. Hence  $CaCl_2$  or  $NH_4Cl$  should be administered in order to produce a urine of  $p_H$  about 5 before the rate of urinary excretion of (I) is determined. Of the urinary constituents  $PO_4'''$ , creatine, and urea increase the rate at which (I) is oxidised, whereas  $Cl'$ , creatinine, and uric acid have a stabilising effect.  $Cl'$  counteracts the effect of  $PO_4'''$  when the  $PO_4'''$  concn. is equiv. to  $>80$  mg. of P per 100 ml.

NUTR. ABS. (m)

**Stabilisation of ascorbic acid by metaphosphoric acid.**—See A., II, 228.

**Distribution of vitamin-C in animal and plant tissues.** I. A. FUJITA and T. EBIHARA (Biochem. Z., 1937, 290, 201—208).—Results of determinations by the authors' method are tabulated. In many animal tissues,  $>80\%$  of vitamin-C is present in the reduced form but in blood  $>94\%$ , and in organs containing high proportions of blood-constituents, a considerable amount is oxidised. The green leaves and outer parts of vegetables and fruits contain more -C than do other parts. Much of the -C of leaves is oxidised but the reduced form predominates in oranges and lemons. Black tea contains no -C but green tea contains  $>0.22\%$  ( $>0.15\%$  of reduced -C).

W. McC.

**Vitamin-C in fresh pineapple juice and in guavas.** C. D. MILLER and R. C. ROBBINS (Hawaii Agric. Exp. Sta. Rept. [1933], 1934, 25).—The vitamin-C content of fresh guava juice was equal to and that of pineapple juice about half that of orange juice (guinea-pig assay).

CH. ABS. (p)

**Determination of ascorbic acid in vegetables and fruits.** O. FERNANDEZ and C. ALFAGEME (Rev. Sanid. Hig. publ., 1936, 11, 525—535).—The following vals. [mg. of ascorbic acid (I) per 100 ml. of juice for the first 6 items and per 100 g. of fresh tissue for the remainder] were obtained: Valencia oranges 42, Almeria oranges 53, grape fruit 26, tomato 18, mandarin 26, lemon 52, various kinds of apple 2.2—2.6, pears 2 (skin 10), strawberries 46, banana 4, green pimento 125, red pimento 236, paprika 106, cabbage 64, cauliflower leaves 134 (flower 77), lettuce 11, spinach 30, carrot leaves 69 (root 11). In all cases the (I) content of the peel and the outer leaves was approx. three times that of the juice and the inner leaves, respectively.

NUTR. ABS. (m)

**Ascorbic acid content of bananas at three stages during ripening.** R. M. LEVERTON (Food Res., 1937, 2, 59—63).—The ascorbic acid content of bananas from 21 hands at the green, yellow, and fully-ripe stages averaged, respectively, 0.061, 0.063, and 0.073 mg. per g. of pulp.

E. C. S.

**Vitamin-C content of oranges and lemons.** J. E. RICHARDSON, R. DAVIS, and P. SULLIVAN (Food Res., 1937, 2, 81—83).—On an average, one orange contains 20—30 mg., one lemon 18 mg., of -C.

E. C. S.

**Ascorbic acid content of Manchuria paprika (*Capsicum annuum*, L., var. *grossum*, Sendt.).** M. SUGIURA (J. Orient. Med., 1936, 25, 37).—The ascorbic acid (I) content of the paprika increases during ripening but diminishes on storage, exposure to air after rubbing, or removal of the capsaicin by extraction with  $Et_2O$  or treatment with  $KMnO_4$ . In ripe paprika the ratio (I) : glutathione (II) is 1.0 : 1.7; unripe pods are devoid of (II).

NUTR. ABS. (m)

**Vitamin-C in gladiolus leaves.** O. DISCHENDORFER (Arch. Pharm., 1937, 275, 242—255).—Gladiolus leaves contain 0.007—0.97% of *l*-ascorbic acid, shown by colour reactions to be contained in the sap. The "bound" vitamin is probably associated with the chlorophyll, since some grains of the latter are stained superficially and irregularly by acid  $AgNO_3$ .

R. S. C.

**Determination of ascorbic acid.** R. FERRARI and G. BUOGO (Arch. Fisiol., 1935, 35, 125).—The method of Emmerie and van Eekelen is simplified by substituting Zn powder for  $H_2S$ . This displaces the Hg and reduces the dehydroascorbic acid. With urine, blood, and tissue extracts, the modification gives satisfactory results.

NUTR. ABS. (m)

**Determination of ascorbic acid.** A. FUJITA and T. EBIHARA (Biochem. Z., 1937, 290, 172—181).—Greatest accuracy and a high degree of specificity are attained by rapid titration of 2 : 6-dichlorophenol-indophenol solution with a small vol. of ascorbic acid solution after deproteinisation, where necessary, with  $HPO_3$ .

W. McC.

**Colorimetric determination of vitamin-C with phospho-18-tungstic acid.** I. Reduced vitamin-C. II. Total vitamin-C. A. FUJITA and T. EBIHARA (Biochem. Z., 1937, 290, 182—191, 192—200).—I. The phosphotungstic acid is reduced in buffered solution at  $p_H$  3 by ascorbic acid (I) extracted from tissue with aq.  $HPO_3$ , the colour produced being measured with a photometer. Reducing substances other than (I) are rendered inactive by addition of  $CH_2I \cdot CO_2H$ . The degree of specificity is  $>$  that of other methods. With animal tissues, the results are sometimes  $<$  those obtained by the indophenol method.

II. (I) is extracted with  $N-HCl$  and aq.  $Hg(OAc)_2$ , the extract being neutralised by addition of  $NaOAc$  and  $Pb(OAc)_2$ , treated with  $H_2S$ , and freed from  $H_2S$  by evacuation, and (I) determined as above.

W. McC.

**Comparison of biological and chemical methods for determination of vitamin-C in canned, strained vegetables and a study of its variation from year to year.** F. HANNING (J. Nutrition, 1936, 12, 405—412).—Titration with 2 : 6-dichlorophenol-indophenol gives accurate vals. for vitamin-C and is reasonably in accord with biological assays. Year-to-year variations in the -C content of tomatoes, spinach, peas, and beans are considerable.

A. G. P.

**Provitamin-D activity and structure.** Addition of Grignard reagents to 7-ketocholesteryl acetate.—See A., II, 192.

**Metabolism and mode of action of vitamin-D.**  
**II. Storage in different tissues *in vivo*.** W. HEYMANN (J. Biol. Chem., 1937, 118, 371—376; cf. this vol., 46).—After excessive doses of viosterol vitamin-D is present in the following tissues of the male rabbit (in descending order of rate of depletion): brain, erythrocytes (cleared in 6 weeks), intestines, abdominal skin, lungs, kidneys, liver, blood-plasma (still present after 3 months). The duration of -D storage is not related to the lipin content of tissue. Consumption by the tissues is negligible and depletion probably occurs mainly by excretion. R. M. M. O.

**Effect of vitamin-D intake of the hen on bone calcification in the chick.** R. R. MURPHY, J. E. HUNTER, and H. C. KNADEL (Poultry Sci., 1936, 15, 284—289).—Bone photographs show transmission of -D from hen to chick in a definitely quant. manner.

A. G. P.

**Crystalline vitamin-D<sub>3</sub>.** F. SCHENCK (Naturwiss., 1937, 25, 159).—The *m*-dinitrobenzoate of vitamin-D<sub>3</sub> (A., 1936, 982) when hydrolysed affords -D<sub>3</sub>, m.p. 82—84°, [ $\alpha$ ]<sub>D</sub><sup>20</sup> +83.3° in COMe<sub>2</sub>. Max. absorption occurs at 265 mμ; it further resembles -D<sub>2</sub> as it gives a yellow colour with SbCl<sub>3</sub> and has an equal antirachitic potency.

J. L. D.

**Vitamin-P.** A. BENTHATH, S. RUSZNYAK, and A. SZENT-GYORGYI (Nature, 1937, 139, 326—327; cf. this vol., 46).—Hesperidin and the mother-liquor of citrin show properties ascribed to vitamin-P. Quercitrin has no -P activity. Experimental scurvy is the symptom of a mixed -C and -P avitaminosis. The pure -P avitaminosis has no clinical symptoms, but if -C and -P are simultaneously withheld, lack of -P greatly modifies the pathological condition.

L. S. T.

**Factors influencing the incidence of dietary hæmorrhagic disease in chicks.** H. J. ALMQUIST and E. L. R. STOKSTAD (J. Nutrition, 1936, 12, 329—335).—The anti-hæmorrhagic vitamin is present in fæces of chicks receiving a diet free from this vitamin. It is probably synthesised in the lower portion of the intestinal tract and to a further extent in droppings kept for 24 hr. The vitamin is transferred from hen to chicks and occurs in the yolk but not in the white of eggs. Very little is present in liver tissue of young normal chicks.

A. G. P.

**Mathematical treatment of absorption by living protoplasts.** B. RESUHR (Protoplasma, 1936, 25, 435—460).

M. A. B.

**Methods of research on the physical properties of protoplasm.** W. SEIFRIZ (Plant Physiol., 1937, 12, 99—116).—A review.

A. G. P.

**Determination of the molecular energy of protoplasm.** IV. Determining the surface tension of the naked protoplast against a liquid medium. H. PFEIFFER (Protoplasma, 1936, 25, 397—403).—An expression is deduced from which  $\gamma$  can be calc. by simple measurement of the suction required to force the protoplast into a capillary tube.

M. A. B.

**Differences in permeability in different tissues of one plant, and their presumed chemical origin.** K. HÖFLER (Mikrochem., Molisch Festschr., 1936, 224—242).—The plasma of cells from the stalk skin of *Gentiana sturmiiana* differs entirely in its permeability series from that of the corolla cells, and is of amidophilic type, with a more acid plasma, whilst that of the corolla cells is of basic glycerol type. The relation of the results to the chemical nature of the plasma boundary, and to processes occurring there, is discussed.

J. S. A.

**Plasmolysis and permeability [of plant cells].** H. SCHMIDT (Jahrb. wiss. Bot., 1936, 83, 470—512).—In cells of low permeability, plasmolysis with aq. sucrose has little effect on the permeability to urea and glycerol; in high-permeability cells plasmolysis lowers the permeability. Penetration of urea into cells plasmolysed with salt solutions is influenced by the nature of the salt used, the general order of effectiveness being K, Na, Li, (fructose) Sr, Ba, Ca. Et<sub>2</sub>O (1%), tannin (0.1%), MeOH (10%), and saponin (0.1%) lower the permeability of cells whether plasmolysed or not. The protoplasm of cells the permeability of which is not appreciably affected by plasmolysis, neutral salts, or narcotics is classed as "lipin-permeable" and of that which is markedly affected as "pore-permeable."

A. G. P.

**Water relations and osmotic pressures in plant cells.** T. A. BENNET-CLARK, A. D. GREENWOOD, and J. W. BARKER (New Phytol., 1936, 35, 277—291).—The "osmotic val." of the cell sap as determined by the plasmolytic method is > the osmotic pressure indicated cryoscopically, in certain tissues. In other tissues vals. are the same. The bearing of these facts on the flow of H<sub>2</sub>O in tissues is discussed.

A. G. P.

**Electrochemical methods in the study of plant cells.** W. J. V. OSTERHOUT (Trans. Electrochem. Soc., 1937, 71, Preprint 9, 75—83).—Electrochemical methods enable vital processes to be studied with min. disturbance of the organism. The electrical properties of the thin protoplasmic surface layer which regulates cell metabolism have been investigated.

J. W. C.

**Observations on chromosomes by dark field illumination and with ultra-violet light.** H. HELLSTROM and H. VON EULER (Mikrochem., Molisch Festschr., 1936, 209—217).—The relation of the observations, and of effects of fixation with C<sub>6</sub>H<sub>5</sub>N, AcOH, etc., to the chemical nature of the chromosome substances are discussed.

J. S. A.

**Effect of X-rays on *Zea mays*.** M. A. RUSSELL (Plant Physiol., 1937, 12, 117—133).—Irradiation-growth curves for roots and shoots are determined and discussed.

A. G. P.

**Effect of  $\alpha$ -irradiation on extension growth [in seedlings].** H. EBSTER (Jahrb. wiss. Bot., 1936, 83, 423—438).—Exposure to  $\alpha$ -rays inhibits cell elongation, phototropic and geotropic response to similar extents in darkened oat coleoptiles. Growth-substance is detectable in exposed coleoptiles when cell elongation has entirely ceased. The effect of irradi-

ation results from its action on the cell membrane rather than from the destruction of growth-substance.

A. G. P.

**Effects of carbon arc light on chemical composition and vegetative propagation of tomato plants grown with a limited supply of nitrogen.** J. W. MITCHELL (Plant Physiol., 1936, 11, 833—841).—During 10 days' growth in a N-free nutrient with daily exposure to a C arc for 12 hr. the total carbohydrate content of the aerial parts of tomato plants increased fourfold. In plants receiving a limited supply of N, sucrose, starch, dextrin, and the polysaccharides concerned in the thickening of cell walls accumulated rapidly at first and subsequently more slowly. The reducing sugar content varied but little. The decrease in rate of carbohydrate formation is partly due to lowered photosynthetic activity resulting from yellowing and abscission of leaves occurring under these conditions. A. G. P.

**Dependence of carbon dioxide assimilation in a higher plant on the wave-length of radiation.** W. H. HOOVER (Smithsonian Misc. Coll., 1937, 95, No. 21, 13 pp.).—Light from the whole of the visible spectrum activates photosynthesis, the limiting  $\lambda$  for which are 7200—7500 and 3650 Å. The  $\lambda$ -activity curve shows a principal max. at  $\lambda$  6550 and a secondary max. at 4400 Å. Increased reflexion and transmission of radiation in the green region by plant leaves diminish the photosynthetic efficiency of green rays. A. G. P.

**Effect of light on solanine synthesis in potato tubers.** H. W. CONNER (Plant Physiol., 1937, 12, 79—98).—The method described for determining solanine (I) is based on the amount of sugar produced on acid hydrolysis. The increase in (I) content of tubers on irradiation with a Hg arc is accompanied by the appearance of anthocyanin in the shoots. Radiation of  $\lambda$  sufficient for glucose synthesis did not cause formation of (I) but induced chlorophyll (II) production. Ultra-violet rays (0.3  $\mu$ ) induce formation of (I) but not that of (II). A. G. P.

**Photoperiodic response of certain long- and short-day plants to filtered radiation applied as a supplement to daylight.** R. B. WITHROW and J. P. BIEBEL (Plant Physiol., 1936, 11, 807—819).—Red radiation is the most effective in producing photoperiodic response in long- and short-day plants. Specially sensitive plants (*e.g.*, aster) may respond to blue light. Green radiation has little effect when used to prolong the day. A. G. P.

**Effect of temperature on the responses of plants to photoperiod.** R. H. ROBERTS and B. E. STRUCKMEYER (Science, 1937, 85, 290—291).—Temp. slightly  $>$  or  $<$  the usual range employed in greenhouse culture alter the responses of many plants that are generally considered to have a fixed reaction to relative length of daylight. L. S. T.

**Effect of temperature on translocation from leaves.** O. F. CURTIS and S. D. HERTY (Amer. J. Bot., 1936, 23, 528—532).—Transport of carbohydrates from bean leaves was restricted by lowering the temp. of the petioles to 0.5—4.5° but did not cease entirely at 0° to —2°. A. G. P.

**Relation of reserves to cold-resistance in lucerne.** J. J. MARK (Iowa Agric. Exp. Sta. Res. Bull., 1936, No. 208, 304—335).—Late cutting of lucerne prevented the normal accumulation of carbohydrate reserves and resulted in death of the plants during winter. Fission of protein is not a factor in cold-resistance. The presence of available reserves and a genetic ability to use these reserves are important factors contributing to winter hardiness.

A. G. P.

**Frost-hardening mechanism of plant cells.** G. W. SCARTH and J. LEVITT (Plant Physiol., 1937, 12, 51—78; cf. A., 1936, 1304).—Chemical changes associated with hardening include increased osmotic pressure, pptn. of colloids over a wider range of  $p_H$ , slightly decreased  $[H^+]$  in the sap, and increased permeability of the cells to polar substances. Artificial change in the  $p_H$  of sap does not affect hardiness. The mechanism of protection of cells against mechanical injury by frost is discussed. A. G. P.

**Unfrozen water in apple shoots as related to winter hardiness.** A. L. STARK (Plant Physiol., 1936, 11, 689—711).—Experimental data confirm the view that the capacity to retain  $H_2O$  in the unfrozen condition is associated with winter hardiness. In apple shoots the freezing process is partly reversible as in the case of inelastic gels. The proportion of  $H_2O$  unfrozen at —20° is not an adequate basis for characterising the hardiness of varieties.

A. G. P.

**Lag in water absorption by plants in water culture with respect to changes in wind.** J. D. WILSON and B. E. LIVINGSTON (Plant Physiol., 1937, 12, 135—150).—Effects of wind and of various solutions surrounding plant roots are examined.

A. G. P.

**Distribution of the velocities of absorption of water in the onion root.** H. F. ROSENE (Plant Physiol., 1937, 12, 1—19).—Apparatus for determining  $H_2O$  absorption by different root regions of the same intact root is described. Absorption gradients are examined. A. G. P.

**Hydration in fresh and dried red clover roots and shoots with reference to physical properties and chemical composition of tissue.** G. A. GREATHOUSE and N. W. STUART (Plant Physiol., 1936, 11, 873—880).—Ohio and French varieties of red clover can be differentiated as to cold-hardiness by the unfreezable  $H_2O$  in fresh tissue or the rehydration of dried tissue. Factors influencing hydration capacity differ in roots and shoots. Readily available carbohydrates (sugar, starch, dextrin) are important factors. Pectins and pentosans are not concerned. Neither protein- nor non-protein-N is closely related to hydration capacity. Hydration depends on chemical composition as well as on the organisation of the living tissue. A. G. P.

**Growth of germ tubes of *Erysiphe* spores in deuterium oxide.** R. PRATT (Amer. J. Bot., 1936, 23, 422—431).—The course of elongation of germ tubes is represented by a curve characteristic of an autocatalysed unimol. reaction. The initial stages of development were not affected by  $D_2O$ ; the later

stages and the final length attained were restricted, the final length reaching a limiting val. with 75%  $D_2O$ .  $D_2O$  limits the proportion of solutes and colloids within the spore which become utilisable for growth. Inhibited spores regain normal activity on transference to  $H_2O$  media. Transference to 100%  $D_2O$  at any stage of development causes cessation of growth. A. G. P.

**Growth of *Erysiphe* germ tubes in deuterium oxide after exposure to water.** R. PRATT (Amer. J. Bot., 1937, 24, 76—82).—Injury to germ tubes of *E. graminis tritici* placed in  $D_2O$ - $H_2O$  after pre-exposure to  $H_2O$  increased with the  $[D_2O]$  of the mixture, with the period of initial exposure to  $H_2O$ , and with the length of the germ tube at the time of transfer. A. G. P.

**Hydrogen-ion concentration and sexual expression in *Lychnis dioica*, L.** J. F. STANFIELD (Plant Physiol., 1937, 12, 151—162).—In both sexes xylem, epidermis, and sclerenchyma were consistently more acid (by range indicator methods) than other stem tissues. In general whole stems of staminate plants had a higher  $p_H$  than those of pistillate plants. Ovules and vascular strands connected with them were more alkaline than other tissues of the ovary. The ovary wall of the pistillate flower, the base of the stamen filament, and the base of petals in staminate flowers have a similar  $p_H$  range. The pseudo-receptacle of the staminate flower is more acid than the placenta of the pistillate. Differentiation of the sexes was shown by reference to individual tissues but not by a difference in general  $p_H$  range. Potentiometric measurements of saps show greater acidity in staminate flowers. At the blooming stage acidity increases in both sexes. No direct relation exists between  $p_H$  range and sex. A. G. P.

**Acidity of the juice of *Desmarestia*.** H. E. WIRTH and G. B. RIGG (Amer. J. Bot., 1937, 24, 68—70).—The acidity of the juice is not due to the presence of org. acids but probably results from differential absorption of ions from neutral salts. A. G. P.

**Time factor in utilisation of mineral nutrients by hemp.** M. E. TIBEAU (Plant Physiol., 1936, 11, 731—747).—Tallest and most vigorous plants with largest and thickest leaves were obtained by use of Knop's solution with 8 times normal concn. of K. K deficiency caused stunting and Cu mottling. Plants recovered quickly from various temporary periods of K starvation, but in no case attained growth equal to that of plants receiving a continuous K supply. Mg deficiency caused chlorosis but growth was not otherwise affected by the level of Mg supply. Recovery from Mg starvation was slower as the period of starvation was prolonged. Excess of Ca retarded growth and a deficiency induced necrosis and loss of meristematic activity. Recovery from Ca deficiency was more rapid after long periods of starvation. Short periods of N shortage were followed by rapid recovery but early death. Recovery was slow after long periods of deprivation. High levels of N supply at the time of fruit bud differentiation led to formation

of female flowers, and low levels of N favour male inflorescence. A. G. P.

**Mineral nutrient requirements of plants.** P. MACY (Plant Physiol., 1936, 11, 749—764).—A crit. (optimum) % of each nutrient present in each kind of plant is postulated. Higher contents show "luxury consumption" and lower contents are associated with a "poverty adjustment" which  $\propto$  the deficiency, until a min. level is reached. The crit. % composition of a plant is an inherent characteristic. This and the min. val. vary only under extreme conditions. Mitscherlich's law of min. holds only during poverty adjustment, whereas Liebig's law of min. is applicable to the whole of the remainder of the growth curve. The application of these considerations to the assessment of fertiliser requirements for individual crops on particular soils is discussed. A. G. P.

**Mineral nutrition and seasonal growth of *Ageratum* in sand cultures with auto-irrigation.** W. L. NOREM (Amer. J. Bot., 1936, 23, 545—555).—In sand cultures the optimum concns. of the principal nutrients for growth are determined. A. G. P.

**Relation of nutrient salt concentration to growth of the tomato and to the incidence of blossom-end rot of fruit.** W. R. ROBBINS (Plant Physiol., 1937, 12, 21—50).—With sand-cultured plants, nutrient solutions having osmotic pressure 0.08 atm. restricted growth through deficiency of nutrients if supplied at 1 litre per day but good vegetative growth was produced at the rate of 4 litres per day. With nutrients having 0.44—1.7 atm. osmotic pressure excellent growth was obtained. With 3.1 atm. growth was slightly restricted by factors other than nutrient supply, notably by low availability of  $H_2O$  for tissue development. The importance of light, temp., R.H., rate of air movement, and the  $p_H$  and  $O_2$  tension of the nutrient in the appearance of blossom-end rot is shown. A. G. P.

**Entrance of lime and magnesia into plants.** K. P. TULAIKOVA (Chim. Sotz. Zemled., 1935, No. 3, 22—34).—Optimum [Mg] in nutrients for flax and barley are determined. A ratio of Ca : Mg = 1 : 4 was not injurious. The intake of Ca by barley is twice that of Mg, max. utilisation occurring in the final stage of vegetative growth. Max. utilisation of Mg takes place at the flowering stage. Ca facilitates the intake of Mg by young barley plants. CH. ABS. (p)

**Effect of potassium supply on the water relations of foliage leaves.** L. G. G. WARNE (New Phytol., 1936, 35, 403—417).—Application of K increases the  $H_2O$  content of leaves of seakale beet when expressed on an area basis. The simultaneous increase in K content is greater when  $K_2SO_4$  than when KCl is given. Dried leaf material from K-treated plants imbibes increased amounts of  $H_2O$ . This is ascribed to the presence of larger amounts of sol. hygroscopic substances rather than to any change in colloidal constituents. K increases cell and leaf size and decreases stomatal frequency. Its effect on transpiration is due only to the action on stomatal activity. Diurnal changes in stomatal aperture are unaffected by the K supply. A. G. P.

**Physiological effects of potassium on plants.** A. JACOB (Chem.-Ztg., 1937, 61, 278—279).—A review. A. G. P.

**Influence of the chloride ion on the carbohydrate content of potato leaves.** S. S. BASLAVSKAJA (Plant Physiol., 1936, 11, 863—871).—Heavy applications of Cl<sup>-</sup> lower the carbohydrate content of the leaves as a result of decreased chlorophyll content in leaves and diminished photosynthetic activity. Leaves of Cl<sup>-</sup>-treated plants contain relatively higher proportions of starch. A. G. P.

**Influence of chlorides and sulphates on the intake of ammonia- and nitrate-nitrogen by plants.** A. V. VLADIMIROV (Chim. Sotz. Zemled., 1935, No. 3, 14—21).—The rate of penetration of Cl<sup>-</sup> into plants is > that of SO<sub>4</sub><sup>2-</sup>. Cl<sup>-</sup> favours greater absorption of K<sup>+</sup> and NH<sub>4</sub><sup>+</sup> and smaller absorption of NO<sub>3</sub><sup>-</sup>. Univalent cations effect a greater absorption of NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup>, and SO<sub>4</sub><sup>2-</sup> and a smaller absorption of NH<sub>4</sub><sup>+</sup> than do bivalent ions. Intake of NH<sub>4</sub><sup>+</sup> is controlled by the ratio of complementary anions and cations entering the plant. High absorption of NO<sub>3</sub><sup>-</sup> from NH<sub>4</sub>NO<sub>3</sub> (I) is favoured by cations of high entrance capacity, e.g., K, or by anions of low capacity, e.g., SO<sub>4</sub><sup>2-</sup>. The reverse is true for the entry of NH<sub>4</sub><sup>+</sup>. The physiological reaction of (I) depends on the anions and cations accompanying it. CH. ABS. (p)

**Varietal differences in the phosphorus-feeding capacity of plants.** A. S. LYNNESS (Plant Physiol., 1936, 11, 665—688).—Varietal differences are established in the ability of maize plants to absorb P from nutrient solutions in sand culture. The rate of intake of P was not directly  $\propto$  the [PO<sub>4</sub><sup>3-</sup>] of the medium. With high levels of P supply, growth was rapid at first but subsequently declined and plants showed signs of injury. Growth (dry wt.) and P contents of maize were closely related. Sugar and starch contents were inversely related. High correlation is demonstrated between the P-absorbing capacity of plants and the  $p_H$  of the nutrient. Heavy applications of N cause excessive transpiration and early death. Growth response following temporary deficiency was much more marked in the case of P and K than in that of Ca or N. Plants well supplied with P contained much starch, well-developed xylem, and light-to-medium cell walls. These conditions were reversed with low [PO<sub>4</sub><sup>3-</sup>]. In crossing P-deficient with P-responsive strains the gene for P deficiency behaved as a recessive on the F<sub>2</sub> generation. A. G. P.

**Availability of adsorbed phosphoric acid to plants.** V. I. SOKHATNOV and S. V. ODINTZOVA (Chim. Sotz. Zemled., 1935, No. 5, 37—45).—Fe(OH)<sub>3</sub> gels were treated with H<sub>3</sub>PO<sub>4</sub> or NaH<sub>2</sub>PO<sub>4</sub> and after removal of all dissolved PO<sub>4</sub><sup>3-</sup> the gels were used in plant cultures. Plant yields were greatest with gels of highest absorptive capacity. CH. ABS. (p)

**Anion respiration.** H. LUNDEGARDH (Biochem. Z., 1937, 290, 104—124).—The earlier work on the respiration of roots (wheat seedlings) is continued with roots of different ages and glucose contents (cf. A., 1935, 794), and it is confirmed that a special respiratory process is concerned in the absorption

of anions by the roots which is independent physiologically and chemically of the basal respiration of the roots. The amount of anions absorbed divided by the CO<sub>2</sub> eliminated is const. for a particular ion but varies with the ion, being 2 for NO<sub>3</sub><sup>-</sup> and 3 for Cl<sup>-</sup>. The effect of cations is only appreciable with more intense absorption in progress. With nitrates, the cation effect increases in the series Na, K, Mg, Ca, NH<sub>4</sub>, Sr, Ba, H. P. W. C.

**Effect of boron deficiency on structure of Zea mais.** E. T. ELTINGE (Plant Physiol., 1936, 11, 765—778).—The effect of B deficiency on the development of the plants is examined. Deficient plants had higher dry-matter contents. A. G. P.

**Boron content of apples at different stages of development.** J. C. JOHNSON and W. A. DELONG (Plant Physiol., 1937, 12, 219—220).—In healthy fruit the total B content increases progressively through the season, very rapidly during the period of active cell division and rapid growth. The B content (on dry wt. basis) decreases rapidly during June—July (Nova Scotia) and subsequently remains practically const. The B content of parings differed but little from that of the flesh. A. G. P.

**Cryptotrophic malnutrition of sorghum in solution culture.** K. A. GROSSENBACHER and B. E. LIVINGSTON (Amer. J. Bot., 1936, 23, 588—591).—Mn, B, Zn, and Cu are necessary for the growth of sorghum. Effects of deficiencies of these elements are discussed. A. G. P.

**Relation between chemical nature of substrate and degree of chlorosis in maize.**—See B., 1937, 479.

**Effect of plant nutrients, soil reaction, and light on gardenias.**—See B., 1937, 480.

**Nitrogen metabolism of plants.** M. LEMOIGNE (Chim. et Ind., 1937, 37, 636—645).—Current theories are reviewed. A. G. P.

**Methods for studying nitrogen metabolism in plants.** F. S. ORCUTT and P. W. WILSON (Plant Physiol., 1936, 11, 713—729).—Sap is pressed from macerated material and is heated at 70° to ppt. protein. Amide-N in the clarified sap may be hydrolysed by 20% aq. NaHSO<sub>3</sub> without humin formation. Hydrolysis of N compounds intermediate between proteins and NH<sub>2</sub>-acids is effected (also without humin production) by an enzyme solution containing proteinase, carboxy- and amino-polypeptidase, and dipeptidase. The hydrolysis process eliminates error in phosphotungstic acid pptn. and in "other N" determinations due to the presence of peptides. The latter are more accurately determined from  $\alpha$ -NH<sub>2</sub>-acid vals. observed before and after hydrolysis. A method of N fractionation is shown and vals. for top and root saps of soya bean are recorded. A. G. P.

**Nitrogen in relation to the growth of citrus cuttings in solution cultures.** A. R. C. HAAS (Plant Physiol., 1937, 12, 163—172).—Depletion of the N supply to rooted cuttings of Lisbon lemon was followed by collapse of the root system and loss of leaves. N-deficient leaves differ from those affected by chlorosis due to  $p_H$  changes. Tops of

cuttings grown with  $\text{NH}_4^+$  as sole source of N increased in size with the  $[\text{NH}_4^+]$  given but had the appearance of N-deficient leaves. Rapidly growing cuttings may not obtain sufficient supplies of N from frequently renewed nutrients of very low N concn. In media containing 785 p.p.m. of  $\text{NO}_3^-$ ,  $>5$  p.p.m. of  $\text{NO}_2^-$  was injurious. A. G. P.

**Nutritional studies of loblolly pine.** R. M. ADDOMS (Plant Physiol., 1937, 12, 199—205).—In sand cultures the pine utilised  $\text{NO}_3^-$  more effectively in acid and  $\text{NH}_4^+$  more effectively in nearly neutral media. A. G. P.

**Nitrite and formaldehyde formation in certain algæ.** A. L. SOMMER (Plant Physiol., 1936, 11, 853—861).—Light is an important factor in the reduction of  $\text{NO}_3^-$  to  $\text{NO}_2^-$  in algal cells.  $\text{PO}_4^{3-}$  accelerates the reduction process and also the formation of  $\text{CH}_2\text{O}$ . Combination of  $\text{NO}_2^-$  and  $\text{CH}_2\text{O}$  is probably an early stage in protein synthesis, which may take place simultaneously with the condensation of  $\text{CH}_2\text{O}$  to form sugars. A. G. P.

(A) Availability of proteins and inorganic salts of the green leaf. (B) Availability of carbohydrates and fats of the green leaf: crude fibre. M. K. HORWITT, G. R. COWGILL, and L. B. MENDEL (J. Nutrition, 1936, 12, 237—254, 255—273).—(A) Among *in vitro* digestion methods none was suitable for evaluating the utilisable N of green leaves. In determining available N better results can be obtained by removal of fat-sol. N ( $\text{EtOH-Et}_2\text{O}$ ),  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , and amide-N (reduction and distillation with  $\text{MgO}$ ) prior to Kjeldahl determination of protein and  $\text{NH}_2$ -acid. Digestion of entire leaves of spinach by successive treatment with pepsin, trypsin, and erepsin gave results similar to those obtained with pure proteins. *In vitro* tests indicate that only a part of the Ca and Fe of spinach is utilisable. All  $\text{Cl}^-$  and  $\text{PO}_4^{3-}$  is  $\text{H}_2\text{O}$ -sol.

(B) Taka-diastase contains a maltase capable of converting maltose (I) into glucose, provided the concn. of (I) in the substrate is  $>0.25$  g. per 100 c.c. Enzymic methods for determining crude fibre yield vals. for spinach which are  $>$  thrice those obtained by A.O.A.C. methods. The proportion of true fats in foodstuffs is determined by hydrolysis of the  $\text{EtOH-Et}_2\text{O}$  extract and subsequent fractionation with light petroleum to eliminate chlorophyll etc. A. G. P.

**Sequence and climatic distribution of some plant acids.** J. B. MCNATR (Amer. J. Bot., 1936, 23, 629—634).—The distribution of oxalic, succinic (I), malic, tartaric (II), and citric (III) acids in plants from different climatic zones is examined. The production in plants of other acids from (I) by successive oxidation processes is indicated. Tropical plants tend to produce (II) and temperate plants to produce (III). A. G. P.

**Distribution and formation of acid amides in higher plants.** G. SCHWAB (Planta, 1936, 25, 579—606).—Methods for determining asparagine (I) and glutamic acid (II) in plants are described. Both occurred simultaneously in all plants examined but their relative proportions varied considerably in

different species. Three classes of plants are distinguished, viz., those characterised by high (I), by high (II), or by similar (I) and (II) contents. Under certain physiological conditions plants in which one amide is dominant may produce very considerable amounts of the other. The formation of the typical plant amide  $\propto$  the accumulation of  $\text{NH}_3$ . The proportion of the "opposite" amide is  $\propto$  the rate of amide decomp., the typical amide being the more rapidly formed and the more readily decomposed. Both amides act as  $\text{NH}_3$  detoxicants. The nature of the amide formed depends on constitutional factors and is probably related to the activity of sp. amidases. The extent of amide formation is controlled by the  $\text{NH}_3/\text{sugar}$  ratio in the plant. A. G. P.

**Storage of sugar in the roots of beet. Significance of invertase.** A. I. OPARIN (Biochimia, 1937, 2, 135—145).—In sugar beet and fodder beet from various parts of the U.S.S.R. the sugar content is inversely  $\propto$  the invertase (I) content and the ratio sucrose : hexoses decreases as the (I) content increases. Beet from dry areas has a lower (I) content than beet from well-watered areas. In beet (I) has synthetic as well as hydrolytic action. W. McC.

**Dynamics of formation of cell wall constituents of rye straw (*S. cereale*).** A. M. PALEEV (Biochimia, 1937, 2, 3—18).—The content of  $\text{H}_2\text{O}$ -sol. carbohydrates (I) falls, and those of xylan (II) and cellulose (III) rise, until blossoming. Seed formation is associated with a slight rise in (I), and a fall in (II) and (III). At maturity the (II) and (III) contents are at a max., and the (I) content at a min. The lignin content rises continually during growth. R. T.

**Synthesis of hyoscyamine in *Atropa belladonna*.** B. T. CROMWELL (Biochem. J., 1937, 31, 551—559).—The effect of withdrawal of essential elements and of presenting N in different forms on the synthesis, in particular of total alkaloids in terms of hyoscyamine (I), in culture plants of *A. belladonna* is determined. (I) formation is not affected by withdrawal of K and still continues on withdrawal of N. Administration of N as asparagine, hexamine, or  $(\text{NH}_4)_2\text{SO}_4$  increases (I) formation but N as  $\text{Ca}(\text{NO}_3)_2$ ,  $\text{KNO}_3$ , or urea produces no change. Plants grown in the dark and fed  $\text{KNO}_3 + \text{glucose}$  show increased (I) formation. Detached leaves with their petioles placed in the dark in aq. glucose or  $\text{KNO}_3$  or in  $\text{H}_2\text{O}$  show increased (I) formation provided carbohydrate reserve is present. Starvation experiments on leaves attached to the plant show an increase in (I). P. W. C.

**Inheritance of carotene in carrots.** S. L. EMSWELLER, P. C. BURRELL, and H. A. BORTHWICK (Proc. Amer. Soc. Hort. Sci., 1935, 33, 508—511).—Carotene (I) contents were higher in phloem than in xylem, and greater in the top than in the bottom of roots. Colour and (I) contents were closely related. Inbreeding of carrots increases the uniformity in (I) content. A. G. P.

**Persistence of chlorophyll [in leaves] following bacterial action.** G. NICOLAS and B. AGGERY (Compt. rend., 1937, 204, 611—613).—Localised semi-transparent areas of leaves are associated

with the presence of certain bacteria on the surface of the chloroplasts. The no. of chloroplasts in affected tissue is small. During yellowing of leaves with age the infected tissue remains unchanged, the transformation of chloroplasts into yellow chromoplasts being retarded by the bacteria. The apparent "fixation" of the chlorophyll is discussed.

A. G. P.

**Physiology of symbiosis in Leguminosæ.** K. MOTHES and J. PIETZ (Naturwiss., 1937, 25, 201—202).—With young nodules of *Vicia faba*, the bacterial tissue is red in colour, due to the presence of a very labile oxidation product (I) of dihydroxyphenylalanine, which can be stabilised only at an oxidation potential of  $r_H > 15$ . Active nodule tissues in  $N_2$  develop an  $r_H > 7$ . Bacterial cultures normally use  $O_2$ . Cultures growing in  $N_2$  develop  $r_H 4$ , which on aeration rises to 22—24, the culture developing well with  $r_H 15$ —24. This  $r_H$ , which is decisive for bacterial growth, is attained without  $O_2$  in presence of (I).

P. W. C.

**Rôle of ascorbic acid in reduction of nitrates in plant tissues.** D. M. MICHLIN (Biochimia, 1936, 1, 617—627).—Potato tubers contain 0.015—0.020% of ascorbic acid (I). Part of (I) added to potato juice undergoes reversible oxidation. In presence of (I)  $NO_2^-$  added to the juice undergoes rapid reduction, chiefly to unidentified products, not including  $NH_3$ , and partly to  $NO$ . The process of reduction of  $HNO_2$  to  $NH_3$  by *Chlorella* is not affected by (I).

R. T.

**Biological rôle of vitamin-C in plants.** II. K. I. STRATSCHITSKI and B. A. RUBIN (Biochimia, 1936, 1, 642—653).—Cabbage and salad leaves, and tomato and cucumber fruit, and their juices, cause reversible oxidation of ascorbic acid (I). The oxidation becomes irreversible after the lapse of a period, the length of which varies inversely with the  $p_H$ . Dehydroascorbic acid injected into living cabbage leaves undergoes reduction, and greatly increases the respiratory rate of the leaves.

R. T.

**Enzymic activity of living plant cells in relation to "vernalisation" of seeds.** I. Effect of vernalisation on the direction of invertase action. N. M. SISAKJAN (Biochimia, 1937, 2, 263—273).—In winter wheat and cotton vernalisation of the seeds greatly increases the hydrolytic and correspondingly decreases the synthetic activity of the invertase (I). In cotton, onions, and cabbage the ratio is highest in the slow-ripening varieties. Vernalisation causes decrease in the sucrose and increase in the hexose contents. Vernalisation affects (I) by altering the structural state of the cell colloids.

W. McC.

**Enzymic reduction of nitrate in green vegetable cells.** D. M. MICHLIN and P. A. KOLESNIKOV (Biochimia, 1937, 2, 402—412).—The enzyme of vegetable cells which reduces  $NO_3^-$  is a sp. aldehydease. Addition of aldehydes ( $MeCHO$ , glyceraldehyde) affects the rate of reduction only after the reducing substances of the cells have been consumed. Reduction of  $NO_3^-$  then occurs only in presence of aldehydes.  $AcCO_2Na$  reduces  $NO_3^-$  because it is decarboxylated by the carboxylase of the cells with production of  $MeCHO$ .

W. McC.

Q (A., III.)

**Biological rôle of enzymes in plants.** I. Action of invertase as a factor in sugar storage. B. A. RUBIN and O. T. LUTIKOVA (Biochimia, 1937, 2, 423—436).—In leaves and roots of various species of beet the sugar (I) content increases with increasing invertase (II) content but in the autolysed, pulped roots the (II) content is inversely  $\propto$  the (I) content. The hydrolytic action of (II) (and in some species the synthetic action also) in the leaves increases with duration of growth. In roots the synthetic action predominates. In leaves the synthetic action increases in the middle of the day. Where the total sugar content of beet is high the abs. content and % of hexoses are low.

W. McC.

**Quantitative catalase index in barley.** S. S. ELIZAROVA (Biochimia, 1937, 2, 442—453).—The index is a genotypic character and is not affected by the latitude of the place of reproduction but is high in northern types, intermediate in mountain types, and low in southern types. The index decreases in summer and increases in autumn and winter.

W. McC.

**Change in activity of enzymes, soluble carbohydrates, and intensity of respiration of rice seeds germinating under water.** P. S. ERYGIN (Plant Physiol., 1936, 11, 821—832).—Compared with germination on moist filter-paper, germination under  $H_2O$  involves greater losses of dry matter, suppression of enzyme activity (notably of invertase, catalase), decreased respiratory rates, and modifications of relative respiration rates among different strains. Sol. carbohydrates (mainly monosaccharides and sucrose) occur in larger amounts in seeds of lowland than in those of upland varieties. Small amounts of maltose occur in seeds germinated under  $H_2O$ .

A. G. P.

**Membrane effect of the absorbing tissues and the intake of dyes by living (plant) cells.** A. T. CZAJA (Planta, 1936, 26, 90—119).—Cell walls of lower and higher plants show an alkaline membrane effect towards basic dyes. In *Spirogyra* cells the cation of basic dyes is first absorbed by the cell wall and thence as a dye salt passes into the cytoplasm. With dil. solutions of basic dyes nearly the whole of the anion remains in the external solution. Addition of appropriate salts to the basic dye solution retards the adsorption of the cation and its passage into the cell.

A. G. P.

**Adsorption-absorption and translocation of derris constituents in bean plants.** R. A. FULTON and H. C. MASON (Science, 1937, 85, 264).—Derris constituents are adsorbed-absorbed and translocated to new growth of bean plants treated with a suspension of derris powder in  $H_2O$ .

L. S. T.

**Effect of ethylene chlorohydrin and thiourea on *Elodea* and *Nitella*.** B. MARCY (Plant Physiol 1937, 12, 207—212).— $CH_2Cl-CH_2-OH$  (<1%) and  $CS(NH_2)_2$  (<5%) increased the rate of protoplasmic streaming in *Elodea* and *Nitella* after 24—48 hr. Larger concns. were toxic in both cases. The max. increase in streaming averaged 70—100%.

A. G. P.

**Effects of colchicine and of *Viscum album* preparations on germination of seeds and growth**

of seedlings. L. HAVAS (Nature, 1937, 139, 371—372).—When applied to wheat seedlings colchicine (I) at first stimulates the rate of development of roots and root hair and then depresses and finally arrests root growth. A dialysate of *Viscum*, containing no alkaloid, added to (I) had a growth-inhibiting action > either dialysed *Viscum* or (I) applied separately. Simultaneous administration of (I) and the pressed sap of *Viscum* (containing viscalbin) had no such effect, but increased the total wt. of the shoots compared with that of seedlings treated with *Viscum* sap or (I) alone. L. S. T.

Physiology of pollen germination in *Corylus avellana*: pollen and stigma suction force; swelling phenomena of the pollen colloids. H. SCHOCH-BODMER (Protoplasma, 1936, 25, 337—371).—The colloids of pollen grains can take up H<sub>2</sub>O when kept over aq. sucrose  $\times 1.6$ — $1.8M$ , i.e., corresponding with 70—90 atm. osmotic pressure, but the optimum for germination is  $0.4M$ , which corresponds with the suction force of the stigma (8—13 atm.). The amount of swelling of pollen grains on the stigma is about the same as when placed over  $0.4M$ -sucrose. Over  $0.1$ — $0.2M$ -sucrose H<sub>2</sub>O uptake and swelling are too rapid and germination is abnormal. When immersed in dil. solutions or H<sub>2</sub>O the pollen grains soon die due to O<sub>2</sub> shortage, the sol. matter of the cell sap is discharged through the wall, and the protoplast coagulates. M. A. B.

Retarded germination in seed of *Hypericum perforatum* caused by calcium. H. A. BORTHWICK (Bot. Gaz., 1936, 98, 270—282).—Small amounts of Ca, e.g., that in tap-H<sub>2</sub>O, retarded germination. The effect is not related to the  $p_H$  of the H<sub>2</sub>O.

A. G. P.

Formation of purine-nitrogen during germination. P. DE GRAEVE (Compt. rend., 1937, 204, 798—800).—Purine-N, mainly as allantoic acid, increases in seeds of *Trifolium sativum* during germination, reaching a max. after 20 days and then decreasing. With N-poor seeds (wheat, maize) the accumulation of purine-N is mainly as allantoin, indicating a very low allantoinase activity.

F. O. H.

Determining germination of seeds by detecting embryo respiration with dinitrobenzene. A. A. GUREVITSCH (Chim. Sotz. Zemled., 1935, No. 4, 96—105).—Respiratory activity in living cells leads to reduction of C<sub>6</sub>H<sub>4</sub>(NO<sub>2</sub>)<sub>2</sub>; the reduction products are distributed in active tissue and give a characteristic colour reaction with aq. NH<sub>3</sub>. CH. ABS. (p)

Determination of germinative ability by the dinitrobenzene method without direct germination tests. I, II. A. GUREVITSCH (Ber. deut. bot. Ges., 1935, 53, 303—318; 1937, 55, 54—58).—I. Seeds are treated with C<sub>6</sub>H<sub>4</sub>(NO<sub>2</sub>)<sub>2</sub> (I) in aq. suspension for 5 hr. at room temp. or for 1 hr. at 40—45°. (I) is reduced to NO<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·NH·OH by respiratory activity of viable seeds. Treatment with aq. NH<sub>3</sub> produces a purple colour in areas in which reduction has occurred.

II. The test is given by *o*- and *p*- but not by *m*-(I). Commercial *m*-(I) contains small amounts of the *o*- and *p*-isomerides and gives good results. Con-

versely small amounts of the isomerides in *m*-(I) may be detected by tests with seeds. A. G. P.

Spectrographic method for determining carbon dioxide exchange between an organism and its surroundings. E. D. MCALISTER (Plant Physiol., 1937, 12, 213—215).—Apparatus is described (cf. A., 1936, 812). A. G. P.

Effect of atmospheric humidity on rate of carbon fixation by plants. J. W. MITCHELL (Bot. Gaz., 1936, 98, 87—104).—Assimilation of C by a no. of plants was unaffected by the R.H. of the atm. but was retarded at 30° in *Pelargonium*. Intake of CO<sub>2</sub> continued even after leaf stomata were closed.

A. G. P.

Influence of oxygen and carbon dioxide concentrations on respiration of tomato fruits. F. G. GUSTAFSON (Amer. J. Bot., 1936, 23, 441—445).—By stepwise decrease in [O<sub>2</sub>] and increase in [CO<sub>2</sub>] a crit. ratio is reached at which respiratory activity of tomatoes diminishes. This stage is associated with the stage of development of the fruits. Short exposure to low [O<sub>2</sub>]-high [CO<sub>2</sub>] conditions does not affect growth of fruit but retards ripening. O<sub>2</sub> consumption decreases at a higher O<sub>2</sub> tension than does CO<sub>2</sub> production. O<sub>2</sub> consumption, normally >, becomes <, CO<sub>2</sub> production at certain O<sub>2</sub> : CO<sub>2</sub> ratios. Anaerobic respiration is induced under these conditions. A. G. P.

Respiration of green and chlorophyll-deficient types in maize. M. G. GRONER (Amer. J. Bot., 1936, 23, 381—385).—Respiratory rates of green and albino maize seedlings were the same. Exposure to long periods of light or darkness did not affect the rate in albinos except in the case of sudden exposure to light after prolonged darkness when CO<sub>2</sub> production increased. Re-introduction of air after anaerobiosis had a similar effect. When supplied in nutrient media to seedlings from which the endosperm had been removed, maltose, glucose, and sucrose increased respiratory rates to extents which decreased in the order named. A. G. P.

Chlorophyll fluorescence and assimilation of carbonic acid. VI. Photographic registration and evaluation of time-intensity of fluorescence curves of green leaves. H. KAUTSKY and A. MARX (Biochem. Z., 1937, 290, 248—260; cf. A., 1936, 767).—A description is given of an electrical apparatus with which the relation between the intensity of fluorescence and the time of irradiation of green leaves with ultra-violet light and the effect of temp. on this relation are recorded and measured by means of an automatically produced photographic curve.

W. McC.

Does the combined action of all the spectral colours in white light increase the photosynthetic activity of the individual colours? C. MONTFORT (Ber. deut. bot. Ges., 1937, 55, 142—156).—The effects of white light on the assimilation rates of carotene-rich chloroplasts are > the added effects of the constituent colours. A. G. P.

Influence of deuterium oxide on photochemical and dark reactions of photosynthesis. R. PRATT, F. N. CRAIG, and S. F. TRELEASE (Science, 1937,

85, 271—273; cf. A., 1935, 1177).—With *Chlorella*, the principal effect of  $D_2O$  on photosynthesis is to retard the dark reaction.  $D_2O$  has little, if any, effect on the photochemical stage.  $H_2O$  as well as  $D_2O$  enters into the dark rather than into the photochemical stage of photosynthesis.

L. S. T.

Theory of photosynthesis.—See A., I, 319.

Effect of natural growth-substance and of  $\beta$ -indolylacetic acid on plant metabolism. G. FRIEDRICH (Planta, 1936, 25, 607—647).—In older *Helianthus* shoots and in young wilted seedlings geotropic response is associated with differences in reducing sugar content (high on underside). These differences result from starch hydrolysis or sugar translocation. The response in young turgescient seedlings does not involve differences in sugar concn., possibly because sugar is used in membrane formation. Sugar differences are related to differential distribution of growth-substance. Mechanical bending of stems induces changes in carbohydrate content on the two sides of the stem. At  $0^\circ$  geotropic response in older plants does not set up a sugar gradient. Growth-substance affects the tension of cell walls and only indirectly affects carbohydrate changes. Asymmetric application of  $\beta$ -indolylacetic acid (I) to old *Helianthus* stems causes changes in sugar concn., only after bending is apparent. Similar treatment of seedlings does not affect sugar distribution. Curvature produced in stems by (I) is operated by a mechanism different from that of geotropic response.

A. G. P.

Dependence of the growth of *Avena* coleoptiles and their so-called growth-substance production on the auxin content of the endosperm. R. POHL (Planta, 1936, 25, 720—750).—The increased growth of the coleoptile following treatment with  $\beta$ -indolylacetic acid is due solely to cell extension; no division occurs. The endosperm growth-substance (I) is identical with that of the coleoptile; the difference between blastanin and the coleoptile substance is one of concn. only. Geotropic response is decreased by cutting through the seed coat and aleurone grains, and further soaking in  $H_2O$  diminishes the size of the seedling. The effect is intensified by extracting the cut seed with a sugar solution. Removal of (I) from cut seed by means of an electric current leads to development of a very small seedling which, however, contains the normal no. of cells in the coleoptile. Coleoptiles from uncut seed are not affected by this treatment. (I) from urine increases the length of the coleoptile from extracted seed. Application of pure auxin has the greatest effect. Hetero-auxin and phenylacetic acid have no action.

A. G. P.

Specificity of action of auxins for the *Avena* and pea tests. E. M. SHACKELL (Austral. J. Exp. Biol., 1937, 15, 33—42).—Using substances related to the auxins, plant enzymes, physiologically active substances of animal origin, and chemicals with particular physiological activity, negative results were obtained in most cases in the *Avena* and pea tests. The latter are not sp. for auxins (cf. Went, A., 1935, 131); positive reactions were obtained with thionaphthen-3-acetic and *cis*-cinnamic acids. Plants probably respond to a restricted and definite at.

structure for promotion of growth. The  $\beta$ - $CH_2$ - $CO_2H$  in the indole ring is essential for activity, but replacement of indole-N by C, O, or S does not inactivate the mol.

J. N. A.

Reciprocal differences in *Epilobium* varieties. IV. Internodal growth and cell extension in *E. hirsutum* as influenced by synthetic  $\beta$ -indolylacetic acid. G. SCHLENKER and G. MITTMANN (Jahrb. wiss. Bot., 1936, 83, 315—323).—Stimulation of internodal growth and cell elongation by hetero-auxin is examined.

A. G. P.

Effect of [hetero-]auxin on *Chlorella vulgaris*. H. C. YIN (Proc. Nat. Acad. Sci., 1937, 23, 174—176).— $\beta$ -Indolylacetic acid (I) increased the size of *Chlorella* cells. High concns. of (I) were injurious. When added to the culture medium (I) disappeared fairly rapidly (50% in 2 weeks, 80—90% in 3 weeks). *Chlorella* has little or no ability to synthesize auxin.

A. G. P.

Histological reactions of bean plants to indolylacetic acid. E. J. KRAUS, N. A. BROWN, and K. C. HAMNER (Bot. Gaz., 1936, 98, 370—420).—Indolylacetic acid causes proliferation in cells of the various structural elements of decapitated bean seedlings, the changes resembling those associated with crown-gall produced by *B. tumefaciens*.

A. G. P.

Effect of 3-indolylacetic acid on cell walls of stem and root. W. J. ROBBINS and J. R. JACKSON (Amer. J. Bot., 1937, 24, 83—88).—Stem wall materials (cotton thread, hemp cord) stretch more under tension after treatment with 0.2% indolylacetic acid in lanoline (I). The bending of wall material (paper strip, dried strips of potato tuber, elm twigs) is increased and that of roots (maize, willow, etc.) lessened by similar treatment in comparison with that resulting from application of (I) alone.

A. G. P.

Transport of growth-substance in plants. I, II. F. LAIBACH and O. FISCHNICH (Planta, 1936, 25, 648—659; 26, 81—89).—I. Hetero-auxin applied epidermally to leaves is translocated apically if the flow to the midrib is prevented.

II. Rates of translocation of growth-substance vary considerably in different plant species.

A. G. P.

Transport of root-forming hormone in woody cuttings. W. C. COOPER (Plant Physiol., 1936, 11, 779—793).—Hetero-auxin (I) or a substance activated by (I) is transported in the phloem and in a line parallel to phloem elements. When the basal ends of lemon or rose cuttings are placed in aq. (I) there is some upward movement of the solution depending on the rate of transpiration. Application of conc. aq. (I) to the base of cuttings causes a rapid downward movement of a substance (rhizocalin) which is present in leaves and stems and which is necessary for root formation.

A. G. P.

Auxins and the growth of roots. K. V. THIMANN (Amer. J. Bot., 1936, 23, 561—569).—The action of  $\beta$ -indolylacetic acid (I) on the elongation of the main root of *Avena* and of *Pisum* is the same whether the root-tip is present or not, but is greater when (I) is applied externally than when the cut stump is

treated. Czaja's theory of the inhibitory action of (I) necessitates the occurrence of two streams of (I) in the root and is considered improbable. (I) entering roots from seeds also inhibits root elongation and cannot be classed as a germination hormone. (I) controls lateral branching in *Pisum* roots, and inhibits the elongation of isolated root tips. Differences in response of various plant species to (I) are attributable to differences in their normal (I) contents.

A. G. P.

**Growth-substance and growth of aerial roots of *Vitis gongyloides*.** C. H. ANDREAS (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 174—180).—Effects of environmental conditions on the growth of the roots are examined. Asymmetric application of growth-substance (lanoline paste preps.) restricts growth and causes a positive curvature. Extraction of the roots with acidified (HCl)  $\text{CHCl}_3$  removes a substance which causes negative curvature in *Avena* tests.

A. G. P.

**Growth-substance and seedling roots.** E. R. FABER (Jahrb. wiss. Bot., 1936, 83, 439—469).—Growth-substance (I) applied in paste form symmetrically to root-tips of beans and lupins restricts elongation but not the thickening of the roots. Asymmetrical application causes positive curvature, max. effects being attained with intermediate concns. of (I) in the paste. Conc. pastes cause a negative curvature in decapitated roots, the effect being influenced by the length of root tip removed and by the length of the cotyledons. Entire roots of *Avena sativa* and *Agrostemma githago* show negative curvature and strong growth inhibition with conc. pastes and positive curvature and weak inhibition of growth with less conc. pastes. Removal of cotyledons of lupin and bean seedlings restricts the curvature caused by asymmetric application of (I). In maize, beans, and lupins (I) is translocated in both basal and apical directions. (I) is present in root-tips of these plants, to a smaller extent in those of *Avena*, but not in those of *A. githago* or *Lepidium sativum*.

A. G. P.

**Inhibition of [plant] roots by growth hormone.** R. H. LANE (Amer. J. Bot., 1936, 23, 532—535).— $\beta$ -Indolylacetic acid (I) is a sp. inhibitor of *Avena* roots. Coleoptiles were not affected by application of (I) to roots. Indolylpropionic acid was less effective than (I).

A. G. P.

**Upward effects of auxin in coleoptiles and stems.** R. SNOW (New Phytol., 1936, 35, 292—304).—Evidence is given indicating transportation of hetero-auxin (I) morphologically upward in oat coleoptiles, largely but not entirely by way of the conducting strands. (I) accelerates growth of coleoptiles, in whichever direction it is transported. Retardation of growth of very young internodes of peas by (I) drawn up in the transpiration stream is effected by a process differing from that operating in the retardation produced by external application of (I) paste.

A. G. P.

**Intumescences on poplar leaves. III. Role of plant growth hormones in their production.** C. D. LA RUE (Amer. J. Bot., 1936, 23, 520—524).—Intumescences were induced on leaves of *Populus*

*grandidentata* by application of pieces of leaves on which intumescences already existed, or by injection of  $\text{Et}_2\text{O}$  extracts of such leaves, extracts of *Rhizopus suinus*, or  $\beta$ -indolylacetic acid, the effect being very marked when treated leaves were submerged. Plant hormones cause intumescences on leaves confined in unventilated damp chambers.

A. G. P.

**Cell-dividing and -stretching growth-substance.** A. RIPPEL (Planta, 1936, 26, 164—166).—Distinction is drawn between the cell-elongating action of the auxin group and the cell-dividing effect of the yeast growth-substance.

A. G. P.

**Influence of light on the response of plants to growth-substance.** F. LAIBACH (Jahrb. wiss. Bot., 1936, 83, 324—339).—Darkening of plant organs stimulates growth of other organs situated on the basal side, the effect being regarded as a response to growth-substance. This is conditioned by a substance which is formed in darkened organs, but not in those exposed to light.

A. G. P.

**Inactivation of plant growth-substance by light.** P. R. BURKHOLDER and E. S. JOHNSTON (Smithsonian Misc. Coll., 1937, 95, No. 20, 14 pp.).—Growth-substance (I) in oat coleoptiles or absorbed in agar blocks loses activity on exposure to light of high intensity from a Hg arc or to ultra-violet light. With lateral illumination the concn. of (I) in intact coleoptiles was higher on the illuminated side and in excised tips on the darkened side.

A. G. P.

**Vitamin- $B_1$  a growth factor for higher plants.** J. BONNER (Science, 1937, 85, 183—184).—Vitamin- $B_1$  is an important growth factor for isolated pea roots *in vitro*.

L. S. T.

**Vitamin- $B_1$  and the growth of excised tomato roots.** W. J. ROBBINS and M. A. BARTLEY (Science, 1937, 85, 246—247).—White's demonstration (A., 1934, 1418) of potentially unlimited growth for excised root tips of tomato in a solution containing mineral salts, sucrose, and yeast is confirmed. The effective materials in the dried yeast are sol. in 80% EtOH, and are not destroyed by autoclaving for 12 hr. at  $120^\circ$  at  $p_{\text{H}}$  9.0. Yeast ash obtained at a low red heat cannot replace the yeast. Excised tomato roots grow in White's solution, however, when the yeast is replaced by minute amounts of Merck's natural cryst. vitamin- $B_1$  or synthetic  $-B_1$ . The beneficial effects of yeast are not completely accounted for by its  $-B_1$  content. Pantothenic acid cannot be substituted for  $-B_1$ . Growth factors (probably  $-B_1$ ) are present in samples of purified maltose and glucose.

L. S. T.

**Effect of follicular hormone on growth of culture plants.** K. SCHARRER and W. SCHROPP (Biochem. Z., 1937, 290, 1—23; cf. A., 1936, 256).—The effect of increasing amounts (500—1500 mouse units) of the cryst. hormone on the growth of various plants is investigated. The effect was negligible with lupins and maize, slight with lucerne and clover, but with soya bean considerably increased yields of both bean and straw resulted. The abs. amount of crude protein was decreased with lupins and maize, increased with soya bean, slightly increased with

clover, and was unaffected with lucerne. Changes in ash, K, P, Ca, and Mg contents are also recorded.

P. W. C.

**Parthenocarpy induced by pollen extracts.** F. G. GUSTAFSON (Amer. J. Bot., 1937, 24, 102—107).—CHCl<sub>3</sub>-extracts of pollen contain a substance which initiates growth of the ovary and in some cases causes seedless fruits to be formed.

A. G. P.

**Influence of heavy-metal salts on the geotropic response of plants. II. Effect of copper salts on the plagiogeotropism of *Tradescantia* shoots and the positive orthogeotropism of seedling roots.** H. VON WITSON (Jahrb. wiss. Bot., 1936, 83, 340—358; cf. A., 1934, 1272).—Cu salts disturb the geotropic response of *Tradescantia* shoots and cause a negative curvature. By delaying the geotropic stimulus of Cu-treated shoots a positive curvature is obtained. Removal of the growing tip restricts the positive curvature. These effects are ascribed to the influence of Cu in the formation or translocation of growth-substance.

A. G. P.

**Effect of toxic salts on the degradation of the nucleus through inanition in the lupin.** G. DELOFFRE (Compt. rend. Soc. Biol., 1937, 124, 1234—1236).—The toxic action of CuSO<sub>4</sub>, HgCl<sub>2</sub>, and CdCl<sub>2</sub> occurs between two limits and is of the same order as that on the regeneration of the nucleus (cf. this vol., 189).

H. G. R.

**Effects of pruning the roots of gas-injured trees.** C. G. DEUBER (Amer. J. Bot., 1936, 23, 432—433).—Exposure of roots to H<sub>2</sub>O through which coal gas had been passed caused extensive injury especially to distal parts. Pruning and transference to good soil caused development of new roots and trees became normal in 2 years.

A. G. P.

**Sensitivity of aseptic seedlings to some carcinogenic substances.** A. BERTHELOT and G. AMOUREUX (Compt. rend., 1937, 204, 517—519).—Various growth-stimulating agents [1:2:5:6-dibenzanthracene, 1:2-benzpyrene (I), 3-indolylacetic acid, etc.] have a toxic effect on sunflower seedlings. In one case treatment with (I) caused an efflorescent appearance of cellular origin.

W. O. K.

**Detection of heavy metals in plants and the chromosporodogram method.** S. PRAT (Mikrochem., Molisch Festschr., 1936, 342—349).—The distribution of injected Pb, Cu, and Ni in the cell tissues and cell contents of plants is studied by means of the colour reactions with Na<sub>2</sub>S, rubianic acid, and dimethylglyoxime, respectively. The material after treatment with the reagent is sectioned and examined microscopically. "Spodograms" are obtained by careful incineration of dried tissue on a white glazed tile. The ash skeleton is treated locally with the reagents, preferably in EtOH, giving suitable colour reactions with the metals under investigation, thereby revealing transport or local concn. of the metal.

J. S. A.

**Micro-colorimetric determination of potassium in plant ash.** J. TISCHER (Mikrochem., Molisch Festschr., 1936, 418—435).—1 g. of material is ashed, and the ash is treated with HCl and conc. An aliquot portion of the aq. extract of the residue

is pptd. with Na<sub>3</sub>Co(NO<sub>2</sub>)<sub>6</sub> (I), and K determined as described previously (A., 1931, 1259). In presence of amounts of Fe >50% of the K content, pptn. is effected from 0.76N-AcOH solution. Large amounts of PO<sub>4</sub><sup>'''</sup> necessitate increasing the concn. of (I) in the pptn.

J. S. A.

**Iron storage by blue algæ.** V. VOUK (Mikrochem., Molisch Festschr., 1936, 439—446).—Microchemical evidence as to the localisation and manner of storage of Fe in *Cyanophyceæ* is discussed with reference to its ecological and physiological aspects.

J. S. A.

**Accumulation of calcium oxalate in cells of *Tradescantia fluminensis* rich in starch.** O. WERNER (Mikrochem., Molisch Festschr., 1936, 452—454).—The associated accumulation of cryst. CaC<sub>2</sub>O<sub>4</sub> and starch in the same cell is described.

J. S. A.

**Hydrocyanic acid in grasses.** A. C. LEEMANN (Onderstepoort J. Vet. Sci., 1935, 5, 97—136).—Tests for cyanogenetic glucosides in 88 grass species are recorded. In *Eustachys paspaloides* and *Sorghum verticilliflorum*, HCl or high alkalinity inhibits HCN production. No HCN is eliminated during the making of hay but transformation into other compounds may occur. Heating grass to 59° and 70° liberates as much HCN as does the CHCl<sub>3</sub> test. HCN is removed by 42.5% but not by 95% EtOH. Al and Mn but not Fe, Mg, or Ca inhibit HCN liberation. Pb acetate ppts. the enzyme with denaturation and partly ppts. the glucoside.

CH. ABS. (p)

**Composition of flowers of citrus varieties.** A. R. C. HAAS (Proc. Amer. Soc. Hort. Sci., 1935, 33, 61—66).—Ash constituents (Ca, Mg, K, Na), N, P, sugar, and pectin contents of flowers and small fruits are examined. The no. of flowers produced is the no. of fruits which mature. The abscission of non-effective flowers may involve loss of org. and inorg. constituents in amounts sufficient appreciably to reduce the vigour of the tree.

A. G. P.

**Composition of *Pinus radiata* needles.** H. O. ASKEW (New Zealand J. Sci. Tech., 1937, 18, 651—655).—In 1—2-year plants the mineral and N contents of needles, stems, and roots decreased in the order named. Subsequent changes in composition with advancing age are recorded.

A. G. P.

**Chemical composition, digestibility, and nutritive value of juniper berry cakes (*Juniperus communis*, L.).** B. MAYMONE, R. MARRACINO, and A. CARUSI (Ann. Ist. sper. zootec. Roma, 1935, 2, 401—419).—The cakes are made from the residue from steam-distillation by boiling with H<sub>2</sub>O and compressing. They contain traces of oil (a mixture of terpenes, chiefly  $\alpha$ -pinene) but are free from alkaloids, HCN, and cyanogenetic glucosides. The material contained H<sub>2</sub>O 23.72, crude protein 6.23 (including 5.68 of pure protein), Et<sub>2</sub>O extract 10.75, crude fibre 27.16, N-free extractives 38.00, and ash 4.14% but wide variations were found. The Et<sub>2</sub>O extract yielded 56.55% of acid (calc. as oleic) and 3.86% of unsaponifiable matter. The dried N-free extractives contained reducing sugars 12.7, starch 4.2, and pentosans 9.23%, the remainder probably consisting of org.

acids. The ash was very rich in K and Ca and contained a large excess of fixed bases over fixed acids. The constituents of the cakes had the following digestibilities for sheep: N-free extractives 66, proteins 39, Et<sub>2</sub>O extract 37, crude fibre 20%. The calorie val. of the cakes was about 880 per kg. Sheep receiving  $\frac{1}{2}$  approx. 50% of the calorie val. of their ration as cakes did not suffer in any way but milch cows consumed the cakes with reluctance and could be given only small amounts. NUTR. ABS. (m)

Glucidic constituents of the interior tissue of the stem of papyrus (*Cyperus papyrus*). E. VOTOČEK (Coll. Czech. Chem. Comm., 1937, 9, 126—133).—The parenchymatic tissue of the papyrus stem contains glucose, *d*-fructose, xylosan, glucosan, and cellulose. E. W. W.

Diastatic decomposition of native potato starch. G. WEICHSEL (Planta, 1936, 26, 28—47).—The relative resistance of starch to diastatic decomp. is examined in relation to the structure of the granule, especially in the outer layers. A. G. P.

Water-soluble polysaccharide from barley leaves.—See A., II, 231.

Composition of fatty oils in different parts of plants. V. GERLOFF (Planta, 1936, 25, 667—688).—Fatty oils from roots of *Paeonia officinalis* and of *Lappa major* contained more saturated acids than the corresponding seed oils. Differences are not due to the proportions of linoleic (I) and linolenic (II) acids present. Root oils contain larger proportions of unsaponifiable matter (III) and oleic acid. Oils in the wood and bark of *Tilia cordata* differ in respect of I val., CNS val., and (III). Lime oil contains oleic acid, (I), and small amounts of (II). Lime bark oil contains tiliadin, C<sub>30</sub>H<sub>49</sub>OH. A. G. P.

Constituents of *Hydrocotyle asiatica*. I. M. A. WALI and M. C. T. KATTI (Proc. Indian Acad. Sci., 1937, 5, A, 109—114).—Steam distillation of the products (8.2%) extracted by 95% EtOH from *H. asiatica* affords a small amount of an essential oil. The light petroleum extract of the dried residue (after saponification) contains oleic, linoleic, linolenic, lignoceric, palmitic, and stearic acids and sitosterol (I). Subsequent extraction with Et<sub>2</sub>O and CHCl<sub>3</sub> gives more (I), and the final EtOH extract contains tannin and glucose. No alkaloids are present. J. W. B.

Wax-like constituents from expressed oil from the peel of Florida grapefruit, *Citrus grandis*. K. S. MARKLEY, E. K. NELSON, and M. S. SHERMAN (J. Biol. Chem., 1937, 118, 433—441).—The non-volatile waxy residue remaining after distillation of the peel oil contains the following: solid fatty acids of mean mol. wt. corresponding with C<sub>32</sub>H<sub>64</sub>O<sub>2</sub>; linolenic, linoleic, and oleic acids; a sapogenic ketone, C<sub>31</sub>H<sub>59</sub>O, m.p. 253—254°, [ $\alpha$ ]<sub>D</sub> -20.1° (oxime, m.p. 281—282°); a hydrocarbon fraction which from m.p., setting points, and crystal spacing appeared to consist chiefly of C<sub>29</sub>H<sub>50</sub> and C<sub>31</sub>H<sub>64</sub>; a phytosterol C<sub>28</sub>H<sub>47</sub>OH, m.p. 132—133° (acetate, m.p. 112.5—113.5°; acetate dibromide, m.p. 115°); and umbelliferone. These constituents have their origin in the cuticle wax of the

fruit and are dissolved by the oil during the pressing process. P. W. C.

Naturally occurring linoleic acid in cottonseed and soya-bean oils and the regenerated linoleic acid from  $\alpha$ -linoleic acid tetrabromide of these oils.—See A., II, 227.

New compounds from the unsaponifiable matter of wheat-germ oil.—See A., II, 242.

Isolation of the toxic principle from a species of *Dimorphotheca* (probably *fruticosa*). C. RIMINGTON and D. G. STEYN (Onderstepoort J. Vet. Sci., 1935, 5, 79—80).—The plant contains the cyanogenic glucoside linamarin (cf. A., 1918, i, 526). CH. ABS. (p)

Anisoxide.—See A., II, 257.

Reducing substances in the malt of soya beans produced in Manchuria. M. SUGIURA (J. Orient. Med., 1936, 25, 54).—Germination of the beans is accompanied by increase in the ascorbic acid (I) and decrease in the glutathione (II) content. (I) and (II) appear to be essential for germination. There is twice as much (I) in the green parts of the sprout as in the white parts. NUTR. ABS. (m)

Detection of alantolactone in *Enula* root. R. FISCHER and H. EHRLICH (Mikrochem., Molisch Festschr., 1936, 103—105).—Microsublimation at 50—55°/12 mm. yields alantolactone, micro-m.p. 70—72°. J. S. A.

Natural occurrence of acetylornithine. R. H. F. MANSKE (Canad. J. Res., 1937, 15, B, 84—87).—Air-dried taproots of *Corydalis ochotensis*, Turcz., contain 10% of acetyl-*d*-ornithine, NHAc[CH<sub>2</sub>]<sub>3</sub>CH(NH<sub>2</sub>)CO<sub>2</sub>H, m.p. 266° (corr.; decomp.), [ $\alpha$ ]<sub>D</sub><sup>25</sup> +13.1° in H<sub>2</sub>O (Cu salt, +H<sub>2</sub>O), hydrolysed to AcOH and *d*-ornithine (picrate, new m.p. 207°). E. W. W.

Contents of essential amino-acids in proteins of different varieties of soya beans. M. A. GUBERNIEV and V. I. TOVARNICKIĬ (Trudy Vsesojuz. Inst. Zernobobov. Kul'tur, 1935, 4, 75—85).—The feeding val. of various proteins is recorded. Analyses of NH<sub>2</sub>-acids of glycinin are tabulated. NUTR. ABS. (m)

Cystine, tryptophan, and tyrosine content of the soya bean. F. A. CSONKA and D. B. JONES (Brit. Food J., 1936, 38, 62—64).—Defatted dried meal from beans grown under ordinary and optimal conditions contains: N 8.66—10.51, cystine (I) 0.287—0.491, tryptophan 0.91—1.17, and tyrosine 2.29—3.01%. The (I) content is usually cc the N content. In feeding experiments a diet of beans of low (I) content may lead to (I) deficiency. NUTR. ABS. (m)

Protein content of the bark of black locust, *Robinia pseudacacia*. D. B. JONES and S. PHILLIPS (J. Amer. Chem. Soc., 1937, 59, 595—596).—The inner portion of the bark contains 12.94—27.98% (average 21.5) of protein. The immunity of trees to attack by the locust borer and the protein content are not related. H. B.

Proteins and thymonucleic acid of horse-chestnut (*Aesculus hippocastanum*) seeds. A. N.

BELOZERSKI and I. I. DUBROVSKAJA (Biochimia, 1936, 1, 665—675).—The cotyledons contain a globulin, termed hippocastanin (I), and a nucleoprotein, which, on hydrolysis, yields a protein of a similar  $\text{NH}_2$ -acid composition to that of (I), and a nucleic acid, from which guanine, adenine, cytosine, thymine, and lævulic acid, but not uracil, are obtained.

R. T.

**Proteins of *Festuca pratensis*.** I. S. JAITSCHNIKOV (J. Gen. Chem. Russ., 1937, 7, 388—390).—The seeds contain 14.5% of proteins, for which analytical data are given.

R. T.

**Structure of proteins. IV. Benzoylated protein.** A. KIZEL and K. PSCHENOVA (Biochimia, 1937, 2, 111—126).—Gliadin (I) from wheat and cucurbitin (II) from pumpkin seeds are attacked by NaOH with liberation of reactive groups, but (I) is more resistant than (II) and the groups liberated in (I) are easily eliminated after benzoylation, whereas those liberated in (II) are not. In benzoylated (I) and (II) Bz is bound in 2 (possibly 3) different ways. The benzoylated arginine, histidine, and tyrosine residues are eliminated by cold 0.1N-NaOH.

W. McC.

**Amino-acid composition of proteins from two edible mushrooms; methods of study [of proteins].** A. KIZEL and S. KONOVALOV (Biochimia, 1937, 9, 47—59).—The  $\text{NH}_2$ -acid composition of proteins from *Psalliota campestris* and *Armillaria mellea* has been determined. Certain sources of error in the usual methods are pointed out.

R. T.

**Chemistry of tobacco. V. Do fermented leaves contain protein?** N. I. GAVRILOV and V. M. ROMANOV (Planta, 1936, 26, 6—18).—Barnstein's method gives unduly high vals. for protein in tobacco leaves. The principal protein constituent of the leaves is closely associated with the cell walls, shows no biuret reaction, but gives a positive picric acid test. An alkali-sol. protein is also present. EtOH- and  $\text{H}_2\text{O}$ -extracts of fermented leaves are free from protein, but the crude cell residue contains a very resistant protein. All proteins examined were hydrolysed by conc. acids only with difficulty and approx. 25% of the total N was humified in the process (cf. A., 1929, 1499).

A. G. P.

**Changes in plant nucleic compounds during extraction in presence of trichloroacetic acid.** É. MICHEL-DURAND (Compt. rend., 1937, 204, 613—615).—Discrepancies in examinations of nucleic compounds are ascribed to decomp. effected by 10% aq.  $\text{CCl}_3\cdot\text{CO}_2\text{H}$  at room temp. Use of neutral salt solutions for extraction of nucleoproteins is recommended.

G. P.

**Chemical changes in protein during thermal denaturation.** A. KIZEL and K. OPALJAR (Biochimia, 1937, 2, 82—89).—The % content of dicarboxylic  $\text{NH}_2$ -acids in pumpkin seed globulin falls from about 20 to 6.8—8.7% after heating (95°; 30 min.) with 10% NaCl; the effect is not observed in  $\text{H}_2\text{O}$  and aq.  $\text{CO}_2$ . Other  $\text{NH}_2$ -acids remain unchanged.

R. T.

**Carotenoids of the peach.** G. MACKINNEY (Plant, Physiol., 1937, 12, 216—218).—The caro-

tenoid fraction contains  $\beta$ -carotene, cryptoxanthin, lutein, and zeaxanthin. Only a trace of  $\alpha$ -carotene was detected. Peach differs from apricot in having no  $\gamma$ -carotene or lycopene in the carotenoid complex.

A. G. P.

***Bixa orellana* and carotene.** D. DA F. RIBIERO (Rev. Biol. Hyg., 1935, 6, 98—101).—The nuts of *B. orellana* yield a reddish-brown substance containing red bixin and an orange-yellow material, the former giving a more marked colour with  $\text{SbCl}_3$  than does the latter.

NUTR. ABS. (m)

**Cytological studies on flowers of *Ranunculaceae*.** W. SCHARINGER (Protoplasma, 1936, 25, 404—426).—The anthocyanin bodies in epidermis cells of *Delphinium* petals show a cryst. structure. They may be anthocyanin crystals or cryst. anthocyanophores. The cells also contain doubly-refracting bodies probably of a lipin nature, which can be stained with neutral-red, chrysoidine, and Janus-green and are sol. in acids and alkalis, EtOH,  $\text{Et}_2\text{O}$ ,  $\text{COMe}_2$ , and  $\text{CH}_2\text{O}$ . Osmic acid gives a faint brown and I-KI an intense brown. The cell vacuoles often contain cytoplasmic globules not stainable by neutral-red and containing drops of a fatty oil stainable by Sudan and sol. in EtOH. In certain petals of *D. triste* the cell sap is coloured dark brown by anthophæin and is a solid gel. Plasmolysis or vital staining with neutral-red converts it into a sol.

M. A. B.

**Pigment of the cloudberry, *Rubus chamaemorus*, L.** H. WILLSTAEDT (Skand. Arch. Physiol., 1936, 75, 155—165).—Cloudberries are red until just before they are ripe, when they turn yellow. The red colour appears to be due to anthocyanin. A cloudberry preserve ("mylta") contained 0.455 mg. of total carotene (0.073 mg. of  $\beta$ -carotene) per 100 g., together with  $\delta$ - and  $\gamma$ -carotene, phytoalexin, and zeaxanthin.

NUTR. ABS. (m)

**Red pigment occurring in sugar cane with Sereh disease.** J. C. TINBERGEN and VAN DER VLOODT (Chem. Weekblad, 1937, 34, 254—256).—The red pigment isolated chromatographically on  $\text{Al}_2\text{O}_3$  is sparingly sol. in org. solvents, gives an absorption spectrum totally different from that of purpurin, and yields no anthracene on distillation with Zn. It is not derived from anthraquinone or carotene and is not an anthocyanin pigment.

S. C.

**Chlorophyll.** H. FISCHER (Mikrochem., Molisch Festschr., 1936, 67—98).—A review of the author's work.

J. S. A.

**Physical properties of chlorophyll films.**—See A., I, 301.

**Double refraction and grains of chloroplasts.** F. WEBER (Mikrochem., Molisch Festschr., 1936, 447—451).—The nature of the chloroplasts is discussed.

J. S. A.

**Chemical examination of *Sarcostemma australe*, R.Br., the "caustic vine."** J. C. EARL and J. B. DOHERTY (J. Council Sci. Ind. Res. Australia, 1937, 10, 26—28).—This latex-bearing plant is reported as toxic to cattle. EtOH-extracts of the dried plant yield a wax containing  $\alpha$ - and  $\beta$ -amyrin,

30% of unsaponifiable matter, and a saponin  $C_{22}H_{34}O_{10}$ , giving  $\alpha$ -methylglucoside on acid hydrolysis.

**Chemical properties of the hormone of *Mimosa pudica*.** H. FITTING (Jahrb. wiss. Bot., 1936, 83, 270—314).—The hormone is isolated from the EtOH extract of leaves by pptn. with  $Pb(OAc)_2$ . It is heat-resistant, decomposed by 1% HCl but not by 10% AcOH, readily decomposed by alkalis, is adsorbed by C, is dialysable, and is destroyed by  $H_2O_2$ . A. G. P.

**American mistletoe.** F. J. DESANTIS and E. V. LYNN (J. Amer. Pharm. Assoc., 1937, 26, 219—220).—Analysis of *Phoradendron flavescens* indicates presence of tannin, pentosans, saponins, probably traces of choline derivatives, but no alkaloids or glucosides. F. O. H.

**Tea leaves. III. Constitution of tannin in leaves.** Y. OSHIMA. **IV. Enzyme chemistry of manufacture of black tea.** Y. OSHIMA and K. HAYASHI (J. Agric. Chem. Soc. Japan, 1935, 11, 750—756, 757—759; cf. A., 1934, 571).—III. The cryst. tannin isolated from leaves in 5'-hydroxycatechin.

**IV. d-Catechin and galocatechin are oxidised to reddish-brown products by enzymes extracted from tea buds.** CH. ABS. (p)

**Detection of baptisin in *Baptisia* root.** R. FISCHER and H. EHRLICH (Mikrochem., Molisch Festschr., 1936, 99—102).—Baptigenin (micro-m.p. 278—284°) is obtained by microsublimation from the root and from pure baptisin at 180—200°/12 mm. The glucoside itself is not volatile. J. S. A.

**Histochemical notes on betulin.** M. STEINER (Mikrochem., Molisch Festschr., 1936, 405—417).—Betulin (I) may be detected in plant tissues by micro-sublimation and micro-m.p. determination (247—252°). (I) is found in the outer periderm of the cork in all birch barks, and may be detected similarly in fossil deposits and in peats. J. S. A.

**Chemistry and pharmacology of *Tylophora asthmatica*.** R. N. CHOPRA, N. N. GHOSH, J. B. BOSE, and S. GHOSH (Arch. Pharm., 1937, 275, 236—242).—The plant yields 0.44% of alkaloids, including 0.1% of tylophorine,  $C_{23}H_{27}O_4N$ , amorphous, m.p. 125—130° (decomp.),  $[\alpha]_D^{25}$  —15.8° in  $CHCl_3$  [hydrochloride, m.p. 261—265° (decomp.); hydrobromide, m.p. 252—255° (decomp.); hydriodide, m.p. 243—245° (decomp.); sulphate: aurichloride] (cf. Ratnagiriswaran *et al.*, A., 1935, 1433). Its pharmacological action is described. R. S. C.

**Pharmacognosy of *Matricaria discoidea*, D.C.** P. N. SCHURHOFF and K. HARTWICH (Arch. Pharm., 1937, 275, 256—268).—With the exception of the essential oil the constituents of *M. discoidea* (description and tests recorded) are substantially the same as those of *M. chamomilla*. R. S. C.

**Kousso.** I. Protokosin.—See A., II, 250.

**Karanjin.**—See A., II, 258.

**Fraxinol, a component of ash bark.**—See A II, 254.

**Ayapin.**—See A., II, 254.

**Aristolochine from roots of *Aristolochia indica*, Linn.**—See A., II, 265.

**Narcotoline, a new alkaloid of the poppy.**—See A., II, 265.

**Constitution of l-asarinin.**—See A., II, 259.

**Tobacco alkaloids.**—See A., II, 265.

**Alkaloids of *Corydalis scouleri*, Hk., and *C. sibirica*, Pers.**—See A., II, 265.

**Alkaloids of *Senecio*.** Jacobine, jacodine, and jaconine.—See A., II, 265.

**New alkaloid, rubradinine, from the Rubiaceae.**—See A., II, 266.

**New alkaloid, formosanine, from *Ourouparia formosana*, Matsumura and Hayata.**—See A., II, 266.

**Mitraversine.**—See A., II, 266.

**Micro-analysis of seeds without loss of germinating power.** N. N. IVANOV (Mikrochem., Molisch Festschr., 1936, 243—258).—Micro-analyses are carried out on representative sections of tissue cut from the seed without impairing its viability. Alkaloids are detected and roughly estimated by Burchard's KI + I reagent. Oils are extracted by means of  $Et_2O$  from tissue dried at 100°, and oxidised with acid  $K_2Cr_2O_7$ , the excess of which is titrated iodometrically. Protein, in grist from seed dried at 30—35°, is determined by the micro-Kjeldahl-NaOBr method, with iodometric determination of the excess of NaOBr. J. S. A.

**Rapid staining with buffered Wright stain.** DECOSTELLO (Folia Hematol., 1935, 53, 390—395).—A  $PO_4'''$  buffer at  $p_H$  6.2 is the best diluting fluid. CH. ABS. (p)

**Observation of ultracentrifugal sedimentation by the Toepler "Schlieren" method.**—See A., I, 332.

**Limitations of colorimetric analyses.**—See A., I, 331.

**Determination of small amounts of ammonia and other bases by the use of boric acid.** A. E. SOBEL, H. YUSKA, and J. COREN (J. Biol. Chem., 1937, 118, 443—446).—A method is described for determination of  $NH_3$ , produced by urease action, micro-Kjeldahl distillation, or in the electrometric determination of total base, in which the  $NH_3$  is trapped in 2%  $H_3BO_3$  and titrated back to the original colour, using methyl-red or methyl-red + methylene-blue as indicator. P. W. C.

**Determination of small quantities of arsenic in medico-legal cases.** D. N. CHATTERJI, K. R. GANGULY, and M. Z. FARUQI (J. Indian Chem. Soc., 1936, 13, 751—754).—The material is digested with  $H_2SO_4$  +  $HNO_3$ , and excess of  $HNO_3$  removed by heating with  $(NH_4)_2C_2O_4$  or urea. As is determined by the electrolytic Marsh method, after boiling the solution with pyrogallol —  $H_2SO_3$  to ensure complete reduction to  $As^{III}$ . J. S. A.

**Determination of iron in simple and biological media.**—See A., I, 329.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

JULY, 1937.

**Borders of physics and biology.** "Scientific philosophy." C. E. GUYE (Arch. Sci. phys. nat., 1937, [v], 19, 5—21; cf. A., 1935, 651; 1936, 1149).—A discussion. F. A. A.

**Comparative physiology in high altitudes.** F. G. HALL, D. B. DILL, and E. S. G. BARRON (J. Cell. Comp. Physiol., 1936, 8, 301—313).—The  $O_2$  capacity,  $O_2$  dissociation curves, and electrolyte content of blood of various animals at different altitudes are studied. M. A. B.

**Blood-oxygen changes after passive vascular exercise of the extremities.** J. R. VEAL and W. M. McCORD (Proc. Soc. Exp. Biol. Med., 1937, 36, 9—11).—An increase in  $O_2$  saturation of either superficial or deep venous blood, or both, after application of alternating negative and positive pressures to the extremities for 1 hr., indicates the likelihood of improvement in cases of arteriosclerosis following this form of treatment. P. G. M.

**Sodium content of human erythrocytes.** C. O. GUILLAUMIN (Bull. Soc. Chim. biol., 1937, 19, 441—445).—Blood corpuscles were separated from serum by centrifuging and, after hæmolysis, the solution was treated with  $CCl_4 \cdot CO_2H$ . The filtrate contained 0.035—0.051% Na. E. A. H. R.

**Effect of copper on the rate of disintegration of mammalian erythrocytes.** G. C. WICKWIRE, W. E. BURGE, and R. KROUSE (Amer. J. Physiol., 1936, 116, 638—640). R. N. C.

**Morphological sugar metabolism in the human leucocyte culture.** G. WALLBACH (J. Lab. Clin. Med., 1935, 21, 163—168).—Normal leucocytes grown in plasma show glycogen (I) deposits during the first two days but not after the third day. Addition of (I) or glycerol to the culture increased the deposition of (I). Little or no (I) was synthesised after addition of glucose, fructose, galactose, dextrin, maltose, starch, or EtOH. Insulin or tonephin produced transient (I) storage on the second day. Insulin + glucose and lecithin emulsion + glucose markedly increased storage of (I). Thyroxine and adrenaline had no effect. CH. ABS. (p)

**Enzymes of leucocytes.** X. **Synthesis and degradation of glycogen by leucocytes.** R. WILLSTATTER and M. RODEWALD (Z. physiol. Chem., 1937, 247, 115—126; cf. A., 1934, 93).—Determinations of the amounts of glucose (I), fructose, glycogen (II), and lactic acid (III) in mixtures of pure, fresh horse leucocytes and erythrocytes show that glycolysis does not occur in blood. (I) which disappears is converted into (II), which is then degraded to (III).

The synthesis and degradation of (II) proceed best at  $p_H$  7.5—6.8, in presence of moderate concns. of electrolytes. W. McC.

**Occurrence of protoporphyrin in reticulocytes.** C. J. WATSON and W. O. CLARKE (Proc. Soc. Exp. Biol. Med., 1937, 36, 65—70).—Protoporphyrin (I) of the red blood corpuscles is mainly in the reticulocytes. (I) and brilliant-cresyl-blue are mutually precipitable. P. G. M.

**Percentage of iron in hæmoglobin.** B. S. WALKER and W. C. BOYD (Science, 1937, 85, 360—361).—The correct val. is approx. 0.34 and not 0.0335 (cf. lit.). L. S. T.

**Formation of methæmoglobin by tissues.** F. BERNHEIM and H. O. MICHEL (J. Biol. Chem., 1937, 118, 743—755; cf. A., 1936, 1133).—The production of methæmoglobin (I) from hæmoglobin by tissues is a function of  $O_2$  uptake and is not affected by Cu or colloids. For the amount of (I) produced per unit of  $O_2$  taken up, rat tissues form the series kidney > heart > liver > brain > muscle. Addition of KCN increases (I) production by kidney, brain, and muscle and decreases it by liver and heart. (I) production is increased by tyramine and *l*-alanine but not by succinic acid (II), *d*-alanine, or choline (III). (I) is reduced anaerobically but not aerobically. (II) and (III) increase the extent of reduction, which, however, is much slower than when an equiv. amount of methylene-blue is reduced. W. McC.

**Catalase and peroxidase activity of hæmin.** F. HAUROWITZ [with R. BRDIČKA and F. KRAUS] (Enzymologia, 1937, 2, 9—16).—Paramagnetic susceptibility and the protected position of the central atom in metal-porphyrin complexes do not suffice to explain the catalase and peroxidase activities of hæmin (I).  $H_2O_2$  combines with (I) forming a complex in which the  $H_2O_2$  is readily reduced to  $H_2O$ . A second mol. of  $H_2O_2$ , a readily dehydrogenated chromogen, or H evolved at a cathode can all function as the H-donor for this reduction. All three processes are catalysed by (I). E. A. H. R.

**Influence of calcium and magnesium ions on the stability of hæmocyanin.** J. BROSTEAUX (Naturwiss., 1937, 25, 249).—The stability zone of hæmocyanin (I) (from *Helix pomatia*) at  $p_H$  4.3—7.3 indicated by Svedberg's sedimentation rates (A., 1934, 92) is confirmed by measurements of the mol. wt. by the light-scattering method (cf. Putzeys and Brosteaux, A., 1935, 1302). Addition of Ca or Mg extends the zone of stability on the alkaline, but not

on the acid, side. This accounts for the stability of (I) in snail's blood ( $p_H$  7.8). E. A. H. R.

**Sulphur distribution and basic amino-acids of hæmocyanin from *Limulus*.** A. MAZUR (J. Biol. Chem., 1937, 118, 631—634).—The purified protein (N 17.5, S 1.22%) contains cystine 1.94, methionine 2.53, histidine 4.52, arginine 6.37, and lysine 8.92%. P. G. M.

**Viscosity of solutions of different serum-proteins.** C. ACHARD, A. BOUTARIC, and S. THEVENET (Compt. rend., 1937, 204, 928—931).—The val.  $\eta/\eta_0$  ( $\eta$  = val. for solution and  $\eta_0$  for solvent) for solutions of albumin, myxoprotein, and globulin (from ox serum) in  $H_2O$ , 0.85% NaCl, and 0.1N-NaOH, respectively, at 26° are determined. At any concn., the vals. increase in the above order. If 0.1N-NaOH is used as a common solvent  $\eta/\eta_0$  increases in the reverse order. In each case  $(1/c) \log_e \eta/\eta_0$  is a linear function of  $C$ . Calculations indicate that albumin and myxoprotein do not behave as hydrophilic colloids when dissolved in  $H_2O$  and NaCl, respectively, but only when dissolved in 0.1N-NaOH. J. L. D.

**Isoionic point of serum-proteins. II. Influence of neutral salts.** G. SANDOR [with A. MARCUS] (Bull. Soc. Chim. biol., 1937, 19, 555—592; cf. A., 1936, 1008).—The isoionic point of serum-proteins can be increased by as much as  $p_H$  0.5 in the presence of neutral salts. The magnitude of the effect depends on the nature of both protein and salt. It is greater for albumins than for globulins and  $SO_4^{--}$  has a greater effect than  $Cl^-$ . A quant. interpretation is given of the influence of  $SO_4^{--}$  on cryst. serum-albumin (horse). E. A. H. R.

**Determination of the tyrosine index of serum-polypeptides.** V. CIOCALTEU and G. TANASESCO (Compt. rend. Soc. Biol., 1937, 125, 295—297). H. G. R.

**Tyrosine index of serum-polypeptides. "Tyrosine-reducing" value of trichloroacetic acid filtrates.** V. CIOCALTEU and G. TANASESCO (Compt. rend. Soc. Biol., 1937, 125, 297—299).—The tyrosine index and "tyrosine-reducing" val. are normally 0.025—0.045 and 0.068—0.105 g. per litre of serum, respectively. H. G. R.

**Determination of phospholipins in ox blood.** G. ELLIS and L. A. MAYNARD (J. Biol. Chem., 1937, 118, 701—709).—Solubility in light petroleum of all phospholipins (I) extracted with  $EtOH-Et_2O$  is achieved by distillation in a vac. at low temp. Oxidative determinations then approx. agree with those of (I)-P. The presence of sphingomyelin was demonstrated directly in plasma, and indirectly in the corpuscles from the (I): fatty acid ratios. There is no evidence that blood-(I) is a precursor of milk-fat. R. M. M. O.

**Influence of glucose injection on amino-acid-nitrogen, urea-nitrogen, and hæmoglobin concentration in blood.** E. G. SCHMIDT and J. S. EASTLAND (J. Lab. Clin. Med., 1935, 21, 1—12).—The decrease in blood- $NH_2$ -acids and -urea during glucose tolerance tests in normal cases and in certain diseases is examined. Vals. were unrelated to the degree of hyperglycæmia attained during the tests

or to changes in blood-vol. as shown by hæmoglobin concns. CH. ABS. (p)

**Influence of sucrose ingestion on amino-acid- and urea-nitrogen concentration of the blood.** E. G. SCHMIDT and J. S. EASTLAND (J. Lab. Clin. Med., 1935, 21, 233—235).—Ingestion of sucrose caused a smaller reduction in  $NH_2$ -acid- and urea-N vals. than did that of glucose. CH. ABS. (p)

**Hydrolysis of cholesteryl esters in blood with 50% alcohol. Micro-determination.** M. NORIEGA DEL AGUILA (Bol. Soc. Quím. Peru, 1936, 2, 217—218; cf. A., 1935, 880).—In the determination of cholesterol previously described, the solution of NaOH in  $EtOH$  is replaced by 50%  $EtOH$  (cf. Grigaut, A., 1935, 1261). F. R. G.

**Composition of the blood of the hen during its life cycle.** V. G. HELLER and L. PURSELL (J. Biol. Chem., 1937, 118, 549—553).—There are no significant changes in any constituent of hen's blood (Rhode Island Reds) during the first two years of life. Urea is <, and uric acid and glucose are >, the % in the blood of other domestic animals. P. G. M.

**Inheritance of biochemical characters by animals and its relation to their growth. I. Glutathione concentration in the blood and difference in size of breeds of farm animals. II. Catalase content of the blood of horned cattle and sheep.** V. I. PATRUSCHEV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 573—577 and 579—584).—I. The average glutathione (I) content of the blood of cattle and sheep varies according to breed, the larger and more rapidly growing breeds tending to have high vals. The light but active Kalmyk cattle which have high blood-(I) are an exception. In crosses of the first generation, the blood-(I) approximates to that of the parent with the lower val. II. The catalase content of the blood likewise differs according to breed, the order being approx: the same as in the case of (I). W. O. K.

**Determination of alcohol in blood (modification of Liebesny's method).** K. WREDE and H. SCRIBA (Pharm. Zentr., 1937, 78, 267—268).—Details are given of improvements of the method described by Heiduschka and Steulmann (cf. A., 1936, 1009). W. O. K.

**Homoglycæmic or hypoglycæmic curves for injection of glucose.** J. A. PANGARO (Dia med., 1934, 6, 731).—Homo- or hypo-glycæmic curves in which "hyperglycæmic waves" are lacking are related to latent hyperinsulinism. CH. ABS. (p)

**Distribution of glucose in blood.** I. NEUWIRTH (Amer. J. Physiol., 1936, 117, 335—337).—Human and rabbit blood corpuscles contain a considerable % of the total blood-glucose, their permeability to which is unchanged by  $C_2O_4^{--}$ ; this does not confirm Olmsted's results (cf. A., 1935, 1392; 1936, 1399). R. N. C.

**Preliminary blood survey of Masai cattle in drought periods.** M. H. FRENCH (Ann. Rept. Vet. Sci. Tanganyika, 1934, 65—68).—After long intervals without  $H_2O$ , blood-Ca, -K, -Na, and -inorg. P in cattle were not significantly changed. A large

intake of  $H_2O$  after 3 days' thirst slightly lowered blood-haemoglobin but did not alter inorg. P.

CH. ABS. (p)

**Effect of bleeding on distribution of ions between erythrocytes and plasma in arterial blood.** II. F. SCHMITT and W. BASSE (Arch. exp. Path. Pharm., 1937, 184, 531—537).—Removal of 500 c.c. of arterial blood in dogs causes a fall, followed by a rise to initial val., in the  $CO_2$ -binding capacity of the blood, but a rise above the initial val. was never observed. Electrolyte changes between plasma and red cells are similar to those in venous blood (cf. A., 1936, 1135).

P. W. C.

**Changes in blood chemistry in experimental caustic poisoning.** I. G. VON FAZEKAS (Arch. exp. Path. Pharm., 1937, 184, 587—604).—In experimental NaOH-poisoning in rabbits the following changes occur: hyperglycaemia, considerable increase in inorg.  $PO_4^{'''}$  of whole blood, decrease of serum-Ca, considerable increase of serum-Cl', slight increase of serum-Na, and decrease of serum-alkali reserve.

P. W. C.

**Presence and partition of sodium between erythrocytes and plasma of the blood of man and animals.** S. RASZEJA (Bull. Soc. Chim. biol., 1937, 19, 593—601).—The Na contents of erythrocytes of the horse, rabbit, and pig are of the same order as that of human erythrocytes. Prolonged and rapid centrifuging and washing with isotonic glucose removes part of the Na.

E. A. H. R.

**Distribution of chlorine and urea in blood and bile.** O. MISETA (Rev. med. quir. patol. fem., 1935, 5, 69—124).—The concn. of urea in blood and bile was 0.24—0.49 and 0.19—0.44 and that of Cl' 4.0—4.8 and 4.8—5.6 g. per litre, respectively.

CH. ABS. (p)

**Blood-nitrite.** E. J. STIEGLITZ and A. E. PALMER (Arch. Int. Med., 1937, 59, 620—630).— $NO_2'$  was determined colorimetrically by the intensely coloured azo-dye produced with  $\alpha-C_{10}H_7\cdot NH_2$  and  $2:6:8-NH_2\cdot C_{10}H_5(SO_3Na)_2$ . This gives average blood concn.  $0.8 \times 10^{-6}$  g. per 100 c.c. with a seasonal variation. Sweat and saliva have similar vals. Urine and cerebrospinal fluid gave negative results, but  $NO_2'$  may be obscured by  $H'$ ,  $OH'$ , or phosphate. Various possibilities for the biochemical origin and destruction of  $NO_2'$  are considered.

R. M. M. O.

**Blood as a physico-chemical system. XI. Man at rest.** D. B. DILL, H. T. EDWARDS, and W. V. CONSOLAZIO. **XII. Man at high altitudes.** D. B. DILL, J. H. TALBOTT, and W. V. CONSOLAZIO (J. Biol. Chem., 1937, 118, 635—648, 649—666).—In the acclimatised condition the cell:plasma distribution of  $CO_2$  retains the normal relation to  $p_H$  and oxygenation but there is a definite increase in serum-Cl', causing a consistently lower cell:plasma ratio for Cl'. The polycythemia increases the buffer val. of the blood so that  $p_H$  changes through the respiratory cycle are slighter. The neutralising capacity for fixed acids, however, is lowered through a diminution in  $HCO_3'$ . Other ions show little change. A nomographic description of the behaviour of the blood-electrolytes is established.

R. M. M. O.

**Comparison of changes in the  $p_H$  of arterial blood and saliva during variations of pulmonary ventilation.** C. R. BRASSFIELD (Amer. J. Physiol., 1936, 116, 174—181).—Arterial  $p_H$  in the dog remains const. during resting conditions, but saliva  $p_H$  shows large variations, mostly towards the alkaline side. Reduction of  $O_2$  tension in the inspired air causes an initial rise in both, followed by a fall below resting level; a marked rise follows restoration of normal conditions. NaCN raises both blood and saliva  $p_H$  during respiratory stimulation; subsequent temporary respiratory failure, and in the case of saliva increased secretory rate, cause a fall. The initial rise of  $p_H$  in saliva with NaCN or reduced  $O_2$  supply is considered to be due to a fall in  $CO_2$  produced by hyperventilation, subsequent changes being due to disturbances of cellular metabolism.

R. N. C.

**Spectrography of serum ultrafiltrates.** W. KLEIN [with E. GABER and M. FORSTER] (Z. physiol. Chem., 1937, 246, 224—232).—Spectrographic curves are given for normal serum ultrafiltrates, adsorption ( $Al_2O_3$ , C) and EtOH- and Et<sub>2</sub>O-sol. fractions, and ultrafiltrates after removal of uric acid by uricase preps. Curves are also given for sera from cases of diabetes, nephrosis, uraemia, and pneumonia.

F. O. H.

**Colorimetric determination of the volume of circulating blood. Use of Congo-red for determining the plasma/blood ratio and circulatory plasma.** T. L. GINO (Arch. Ist. Biochim. Ital., 1937, 9, 19—56).—The methods are described.

F. O. H.

**Blood spots.** L. VAN ITALLIE (Bull. Soc. Chim. biol., 1937, 19, 413—433).—A lecture.

**Effect of antiseptics on the course of the Bordet-Wassermann reaction.** A. ROUSLACROIX, L. BOYER, and R. GASTINEL (Compt. rend. Soc. Biol., 1937, 125, 71—74).—Salts of 8-hydroxyquinoline do not affect the course of the reaction and can be used as antiseptics.

H. G. R.

**Preservation of blood for the Bordet-Wassermann reaction with 8-hydroxyquinoline sulphate.** A. ROUSLACROIX, L. BOYER, and R. GASTINEL (Compt. rend. Soc. Biol., 1937, 125, 74—76).—A concn. of 0.01% is recommended to keep the blood sterile for a moderate time.

H. G. R.

**Application of the retarding action of cold on blood-coagulation to the determination of fibrin.** R. SASSIER (Compt. rend. Soc. Biol., 1937, 125, 17—19).—The blood is surrounded by ice during centrifuging, the val. for fibrin by this method being slightly > that from oxalated blood.

H. G. R.

**Coagulation. Bleeding and blood-calcium: its modification by ingestion of a mixture of calcium lactate and ammonium chloride.** R. A. POLETTI (Dia med., 1934, 6, 1091).—Oral administration of  $NH_4Cl$  with Ca lactate (I) diminishes the coagulation and bleeding time as compared with that of (I) alone. Blood-Ca is unaffected.

CH. ABS. (p)

**Analysis of coagulant activation.** J. H. FERGUSON (Amer. J. Physiol., 1936, 117, 587—595).—The low coagulating power of prothrombin (I) in

presence of Ca alone is abolished by extraction with  $C_6H_6$ , but restored and increased by addition of kephalin (II). Boiling the (I) also prevents activation by Ca alone, but increases the potency of the thrombin (III) formed on addition of (II), possibly through weakening of antithrombins by release of extra (II). (III) is not inactivated by extraction with  $C_6H_6$ . (II) is considered necessary for formation of (III), which contains (I), (II), and Ca in chemical combination. The activation of (I) by Ca alone is due to the presence in (I) and fibrinogen of a (II)-like phospholipin "available" for (III) formation. (I) probably originates from serum-globulins.

R. N. C.

**Effect of sulphur compounds on the coagulation of blood.** J. H. STERNER and G. MEDES (Amer. J. Physiol., 1936, 117, 92—101).—Cysteine (I), taurine, and taurocholic acid, added to whole blood, prolong the time of coagulation. The action of (I) is to prevent the activation of prothrombin; its effects on tissue factor, Ca, thrombin, and fibrinogen are negligible. Ascorbic acid, phenosafranin, and  $Na_2HPO_4$  are without effect under the same conditions. (I) and methionine increase the times of bleeding and coagulation when administered orally and intravenously to man (cf. A., 1936, 1531).

R. N. C.

**Determination of the clotting time of blood and plasma.** W. SZANKOWSKI (Arch. exp. Path. Pharm., 1937, 184, 317—326).—The method is described.

P. W. C.

**Heparin and the formation of white thrombi.** C. H. BEST, C. COWAN, and D. L. MACLEAN (Science, 1937, 85, 338—339).—Purified heparin is effective in preventing the formation of white thrombi in dogs suffering vein injury.

L. S. T.

**Occurrence of a substance in red algæ which inhibits blood-coagulation.** H. ELSNER, W. BROSER, and E. BURGEL (Z. physiol. Chem., 1937, 246, 244—247).—Crude preps. of the polysaccharide sulphuric ester from agar or carrageen and the Na salt of galactan sulphuric ester from *Iridaea laminarioides* have an inhibitory effect on blood coagulation comparable with that of heparin preps.

F. O. H.

**Titre of antitoxic serum.** M. WEINBERG and M. GUILLAUMIE (Compt. rend., 1937, 204, 1012—1015; cf. this vol., 6).—The age of a toxin influences its activity, as does the source of the serum, whether measured by the dose test or the min. lethal dose for a mouse. The antitoxic titre (dose test) of antiperfringens serum (376) varies from 50 to 325 units depending on the batch of toxin used even if the serum source is the same. The titre is independent of the hæmolytic properties of the toxin.

J. L. D.

**Salt optimum in antibody-antigen reactions.** J. T. DUNCAN (Brit. J. Exp. Path., 1937, 18, 108—119).—[NaCl] affects the quantity of antibody (I)-antigen (II) compound formed and its (I)/(II) ratio. The optimum [NaCl] depends on the (II) concn. If the [NaCl] is altered after formation of the compound, the composition of the latter changes to that which it would have had if originally formed under the new conditions, i.e., NaCl influences the equilibrium of a

reversible association. Optima for *H* and *O* agglutinations are distinct so that pure *H* or *O* (II) may be separated by application of equilibrium principles.

R. M. M. O.

**Chemical nature of the immuno-specific capsular substance of anthrax bacilli.** G. IVANOVIC and V. BRUCKNER (Naturwiss., 1937, 25, 250).—The immuno-sp. capsular substance of *B. anthracis* was extracted with dil. alkali and purified through its heavy-metal salts and by dialysis. It is a polypeptide-like substance,  $[\alpha]_D -21^\circ$ , built up from *l*-glutamic acid units.

E. A. H. R.

**Viscous protein of anti-anthrax serum.** L. PLACIDI and C. MOREL (Compt. rend. Soc. Biol., 1937, 125, 234—236).—The precipitin of anti-anthrax serum is localised in the viscous protein (this vol., 83).

H. G. R.

**Antigenic components of the toxins of *Cl. botulinum* types C and D.** J. H. MASON and E. M. ROBINSON (Onderstepoort J. Vet. Sci., 1935, 5, 65—75).—Results of injection of toxic filtrates into goats indicated that types A and B are mono-sp., that type C contains 3 components  $C_1$ ,  $C_2$ , and D (slight amounts), and that type D contains chiefly D but small amounts of C are present.

CH. ABS. (p)

**Toxicity of mixtures of *B. coli* toxins and antisera.** G. MAGHERU, A. MAGHERU, and E. BARBULESCU (Compt. rend. Soc. Biol., 1937, 125, 309—310).—The toxicity of the mixture of insol. endotoxin and serum decreases with dilution of the serum.

H. G. R.

**Preparation of antiserum for *B. coli*.** G. MAGHERU, A. MAGHERU, and H. CREANGA (Compt. rend. Soc. Biol., 1937, 125, 306—308).—A mixture of the neurotropic, enterotropic, and insol. endotoxins immunises the horse without the addition of the complete antigen.

H. G. R.

**Preparation of a multivalent antiserum for *B. coli*.** O. S. GWAN (Compt. rend. Soc. Biol., 1937, 125, 228—231).

H. G. R.

**Alum-diphtheria toxoid precipitate.** E. BUXBAUM and C. K. GREENWALD (J. Lab. Clin. Med., 1935, 21, 157—163).—An alum concn. of 2% is required to ppt. toxoids prepared from bacto-veal broth, and one of 1.5% for that from fresh veal broth. The conc. toxoid from fresh veal contains the greater no of  $L_f$  units per g. of N.

CH. ABS. (p)

**Analysis of dysentery toxin by means of the flocculation reaction.** K. HALAPINE (Ann. Inst. Pasteur, 1937, 58, 599—608).—Three zones are given in precipitin tests with dysentery filtrate. This has been used as a basis for separating the toxin into three fractions, obtained by heat in one case and by sp. adsorption in the other two.

**Antigen-O and *Pyocyaneus* endotoxin.** A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 125, 273—275).—The polysaccharide haptens are not toxic to mice even in doses of 5 mg. per animal.

H. G. R.

**Anti-complementary power of guinea-pig serum.** L. NATTAN-LARRIER, L. GRIMARD, and

J. DUFOUR (Compt. rend. Soc. Biol., 1937, 125, 270—273).—Anti-complementary power is developed by heating the serum to 56—62° but the strength is < that obtained in human serum by ageing.

H. G. R.

Fixation of the complement in streptococcic infections. R. DEMANCHE and M. LEVY-BRUHL (Compt. rend. Soc. Biol., 125, 236—238).—EtOH extracts of streptococci can be used as stable antigens for the fixation of the complement reaction.

H. G. R.

Polysaccharide and lipin-polysaccharide tubercular antibodies. K. MEYER (Compt. rend. Soc. Biol., 1937, 124, 1288—1290).—The protein and lipin-protein antibodies (A., 1936, 877; this vol., 117) are in reality sugar and lipin-sugar antibodies.

H. G. R.

Antigenic composition and virulence of *B. typhosus* grown on a chemically defined medium. G. P. GLADSTONE (Brit. J. Exp. Path., 1937, 18, 67—82).—Viantigen formation, non-agglutination with a pure *O* anti-serum, and virulence are retained by the organisms whatever the source of N, but are lost in the absence of glucose, when the C and energy source is either lactate or other products of glucose metabolism.

R. M. M. O.

Influence of calcium and potassium chlorides on the production of agglutinins anti-*O* and -*H*. A. ROSA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1015—1017).—Injection of aq. CaCl<sub>2</sub> increases the production of both anti-flagellatory (*H*) and anti-somatic agglutinin (*O*) in rabbits inoculated with *B. typhosus* whilst that of aq. KCl significantly increases the production only of the *H* agglutinin. F. O. H.

Viantigen of *B. typhosus*. V. Action of formaldehyde. VI. Active and passive immunity. A. GIOVANARDI (Boll. Soc. ital. Biol. sperim., 1937, 12, 4—7, 7—10).—V. In presence of 0.2—1.0% of CH<sub>2</sub>O, the viaggutinin is no longer demonstrable in suspensions of *B. typhosus* after 2 days at 37° or after 4 months at 20°. The non-destruction of the agglutinin in the experiments of Felix *et al.* (A., 1935, 1420) was therefore due to the low temp. used.

VI. Comparative data for the immunising action in rabbits and mice of viantigen preps., vaccines sterilised by 0.2—0.5% of CH<sub>2</sub>O at 37° for 3—30 days, and vaccines from strains of *B. typhosus* free from viantigen are discussed.

F. O. H.

Detoxication of *Vipera aspis* venom by sodium ricinoleate and vaccination of rabbits with the detoxicated venom. E. CESARI and P. BOQUET (Compt. rend. Soc. Biol., 1937, 125, 231—234).—The antigenic power is not lost by detoxication of the venom by Na ricinoleate at  $p_H$  7.6 for 24 hr. at 37°.

H. G. R.

Immunological applications of placenta extracts: oral administration. C. F. MCKHANN, A. A. GREEN, L. E. ECKLES, and J. A. B. DAVIES (Ann. Intern. Med., 1935, 9, 388—397).—Protein extracts composed of globulins from human placenta contain diphtheria and scarlet fever antitoxins and antibodies neutralising poliomyelitis virus and protect susceptible children against measles. CH. ABS. (p)

Has alexin a corpuscular nature? I. LOMINSKI (Compt. rend., 1937, 204, 917—919).—Alexin, like bacteriophage, is probably not in solution, but is corpuscular and discontinuously distributed in serum.

F. A. A.

Active principles of lysogenic filtrates. G. PROCA (Compt. rend. Soc. Biol., 1937, 125, 299—302).—Active lysogenic filtrates promote the growth of secondary colonies which become lysogenic.

H. G. R.

Electrophoresis of immune sera. M. LOURAU-DESSUS (J. Chim. phys., 1937, 34, 149—195).—An apparatus and technique are described with which electrophoresis of serum-proteins etc. may be carried out without causing detectable irreversible changes in them. The distribution of antibody function during electrophoresis indicates that this is the property of a particle having a small charge and isoelectric point  $p_H$  6.2—6.3, comparable with proteins, but not identical with any known protein. In syphilitic sera, sensitivity to the Bordet-Gengou and Bordet-Wassermann reactions is distributed like the antibody, but the distribution of sensitivity to the Kahn flocculation reaction resembles that of globulin.

F. A. A.

Chemical composition of organisms as a specific property. III. Manganese in insects (Formicidæ). A. P. VINOGRADOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 357—359).—The Mn content of various genera of the Formicidæ is characteristic of each genus. No differentiation is apparent among the Acrididæ, the food of which is of much greater uniformity.

A. G. P.

Biochemistry of bromine. II. Bromine content of human tissues. A. H. NEUFELD (Canad. J. Res., 1937, 15, B, 132—138; cf. A., 1936, 1011).—Br is a constituent of all human tissues but varying amounts are found in the same tissues. Br is not concerned with pituitary function. There is no relation between the distribution of Br and Cl in human tissues.

E. A. H. R.

Abundance ratio of isotopes of potassium in animal tissues. A. K. BREWER (J. Amer. Chem. Soc., 1937, 59, 869—872).—The ratio <sup>39</sup>K: <sup>40</sup>K is about 14:20 for most organs, agreeing with previous vals. for plants, minerals, and ocean H<sub>2</sub>O. Bone-marrow is high in <sup>41</sup>K and there is evidence of a possible relation between abundance ratio and the age of the animal.

E. S. H.

Chemical composition of teeth. V. Spectrographic analysis. F. LOWATER and M. M. MURRAY (Biochem. J., 1937, 31, 837—841; cf. A., 1936, 878, 883).—In addition to constituents already known to exist in dental tissue, Na, Ag, Pb, Sr, Ba, Cr, Sn, Zn, Mn, Ti, Ni, V, Al, Si, B, Cu, and Fe were always found. A trace of F was found in human "mottled teeth" and a large amount in the teeth of F-fed rats but not of normal dogs and rats. K occurs only in enamel and dentine of "mottled teeth" and in F-fed rats' teeth.

E. A. H. R.

Double thread structure of human tooth-enamel.—See A., I., 351.

Orientation of crystallites in single [tooth-] enamel prisms.—See A., I., 351.

**Choline in biochemistry.** E. KAHANE (Bull. Soc. Chim. biol., 1937, 19, 205—233).—A lecture.

**Basic constituents of lampreys.** E. STRACK, H. SCHWANEBERG, and G. WANNISCHAF (Z. physiol. Chem., 1937, 247, 52—62; cf. A., 1936, 499; this vol., 108).—The choline chloride (I) and betaine chloride contents of the muscle, intestines (without the liver), and liver of lampreys (*Petromyzon fluviatilis*) are 0.03, 0.015, and 0.0025%, and 0.07, 0.088, and 0.03%, respectively.  $\gamma$ -Butyrobetaine chloride occurs in the liver (0.014%) and muscle. The biological action of extract of the muscle is due to (I) only. Lampreys contain no neosine, homocholine, or homobetaine. W. McC.

**Quantitative preparation of l-cystine from keratin (horse-hair).** A. WEIDINGER (Rec. trav. chim., 1937, 56, 562—564).—Details are given for the quant. isolation (error 0.3%) of cystine by hydrolysis of the fat-free hair with boiling 20% HCl, removal of HCl at 60°/reduced pressure, buffering to  $p_H$  4 with NaOAc, dissolution of the ppt. in 4% HCl, decolorisation with  $PO_4^{3-}$ -free animal charcoal, pptn. from the conc. filtrate with NaOAc, and purification with COMe<sub>3</sub>. The S contents of the original hair and that calc. from the isolated cystine were, respectively, 3.45 and 3.32%. J. W. B.

**Decomposition of human hair by boiling with concentrated magnesium chloride solution.** K. SCHUSTER (Z. physiol. Chem., 1937, 247, 6—8; cf. Zeynek and Dimter, A., 1936, 227).—Human hair boiled for 100 hr. in N<sub>2</sub> at approx. 115° with 40% aq.  $MgCl_2$  saturated with NaCl ( $p_H$  6.6) lost a very small amount of free S, 0.18% of S as  $H_2S$ , 0.024% of  $NH_3$ , and 1.024% of sol. N (0.141% as  $NH_4Cl$ ), the total loss being 6.4%. The residual hair (but not untreated hair) gave with 0.1N-NaOH a homogeneous jelly after 1 week at 37° but was not attacked by trypsin. Hair boiled for 30 and 100 hr. with  $MgCl_2 + NaCl$  yielded 0.55% of and no cystine, respectively, when hydrolysed with conc. HCl.

W. McC.

**Physical and chemical properties of casein fat.** S. G. STEVENSON and A. L. BACHARACH (Biochem. J., 1937, 31, 721—723).—The analytical determinations for the characterisation of natural fats show that casein fat is in most respects indistinguishable from butter fat. The former, however, contains three times as much unsaponifiable matter as the latter.

E. A. H. R.

**Lipin content of the organs of young rats.** A. LANG (Z. physiol. Chem., 1937, 246, 219—223).—The body-wt. and phospholipin (I) and total cholesterol contents of the brain increase rapidly during the first 30—40 days of life and then remain fairly const. or slowly increase. The liver-cholesteryl esters increase, then decrease rapidly, during this period, afterwards remaining approx. const. at the lower level. The liver-(I) increases only slightly with age. The variations in the data from different rats are emphasised.

F. O. H.

**Water and fat content of tsetse flies.** C. H. N. JACKSON (Nature, 1937, 139, 674—675).—Data concerning the  $H_2O$  and fat contents of tsetse flies

at different stages of hunger and of different ages are discussed. In agreement with Jack (this vol., 87) the wt. of fat should be excluded when the % of  $H_2O$  is calc.

L. S. T.

**Water and fat content of tsetse flies.** K. MELLANBY (Nature, 1937, 139, 883).—A criticism (cf. preceding abstract).

L. S. T.

**Chemistry of muscle-glycogen.** F. G. YOUNG (Biochem. J., 1937, 31, 711—715).—Liver- and muscle-glycogen do not differ appreciably in their properties, although some specimens of the latter give solutions differing from those of the former in opalescence and in coloration with I.

E. A. H. R.

**Pigments associated with the fatty tissues of plants and animals.** I. M. HEILBRON and A. E. GILLAM (Nature, 1937, 139, 612—615, 657—660).—An address.

L. S. T.

**Pigments of the eggs and skin of the chameleon.** C. MANUNTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 33—34).—The skin and liver contain xanthophyll (I) (free and esterified) and smaller amounts of carotene (II); large amounts of free (I) and traces of (II) occur in the eggs.

F. O. H.

**Carotenoids of cocoons from a crossed strain of silkworm.** C. MANUNTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 31—32).—The carotenoids occurring in cocoons from various strains of silkworms are discussed from the viewpoint of the Mendelian theory.

F. O. H.

**Quantitative relations between visual stimuli and the production or destruction of melanin in fishes.** F. B. SUMNER and P. DOUDOROFF (Proc. Nat. Acad. Sci., 1937, 23, 211—219).—The melanin content of the goby fish (*Gillichthys mirabilis*) approx.  $\propto$  the log of the albedo of the tank in which it has been kept (albedo = ratio of reflected to direct light) and is only slightly dependent on the abs. intensity of the illumination.

W. O. K.

**Variations in the proportions of the constituents of the silk secretion in different parts of the silk-glands during development.** C. MANUNTA (Bull. Soc. ital. Biol. sperim., 1937, 12, 32—33).—The proportion of sericin in the silk filament in the anterior is > that in the posterior part of the silk gland; it also decreases gradually during growth of the worm. The fibroin core of the filament appears to move towards the secretory pores at a rate > that of the sericin layer.

F. O. H.

**Methods of separation of thyroglobulins.** I. A. SMORODINCEV and A. M. FELDT (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 365—368).—High purity in thyroglobulin (I) preps. is ensured by salting out with  $(NH_4)_2SO_4$  after pptn. of nucleoproteins by AcOH. (I) is not pptd. by AcOH unless denatured. Nucleoproteins are pptd. by half-saturated aq.  $(NH_4)_2SO_4$ . (I) obtained by pptn. by EtOH is impure.

A. G. P.

**Ultracentrifugal studies of compounds of proteins with polysaccharides.** Compounds between proteins and glycogen. E. M. MYSTKOWSKI (Biochem. J., 1937, 31, 716—720).—Glycogen (I) shows great polydispersity in aq. solution. There

is evidence for combination of (I) with serum-globulin (II) in mixtures of the two. Only small particles of (I) combine with (II). (I) does not combine with lactoglobulin.  
E. A. H. R.

**Preparation of proteins by ultracentrifuging.** R. W. G. WYCKOFF (Compt. rend. Soc. Biol., 1937, 135, 3—5).  
H. G. R.

**Thermal transformations of elastoidin.** E. FAURE-FREMIET (J. Chim. phys., 1937, 34, 125—135).—The re-formation of elastoidin-I from -II (see A., 1936, 1462) at  $<62^\circ$  and under tension is not complete. Under the conditions of formation of -II, some hydrolysis takes place, with production of an albumose and loss of S, and the re-formed -I is hydrolysed by trypsin, though less rapidly than is -II.  
F. A. A.

**X-Ray study of the structure of elastoidin fibres.**—See A., I, 350.

**Polarisation studies in collodion membranes and in synthetic protein-lipin membranes.**—See A., I, 359.

**Molecular structure of chromosomes.** D. M. WRINCH (Protoplasma, 1936, 25, 550—569).—A cylindrical structure consisting of parallel and identical chains of protein mols. held together laterally by salt linkings with nucleic acid mols. is postulated. The specificity of the individual chromosome is determined by the particular proteins in the chains. The linkings between the protein mols. in the chain constitute natural breaking points in the chromosome micelle and the genes are the short lengths of micelle between consecutive breaking points.  
M. A. B.

**Irradiated protein as oxidation catalyst of unsaturated acids.** E. KATHER (Arch. exp. Path. Pharm., 1937, 184, 645—658).—Ovalbumin (I) forms a Cu complex which catalyses the oxidation of unsaturated acids. (I) irradiated with ultra-violet light forms a Cu complex which is 5—10 times as active as that from unirradiated (I). The SH groups liberated on irradiation take part in the formation of the Cu complex.  
P. W. C.

**Catalytic action of iron. IV. Activation of iron.** F. EICHHOLTZ and K. UNGERECHT (Arch. exp. Path. Pharm., 1937, 184, 605—611; cf. A., 1935, 781).—Conversion of subcutaneously injected  $\text{Fe}^{II}$  into the catalytically active form in mice is measured with and without simultaneous injection of *d*- and *l*-tartaric, dihydroxytartaric (I), dihydroxymaleic (II), malic (III), and acetonedicarboxylic (IV) acid. (I), (II), and (III) activate  $\text{Fe}^{II}$  *in vivo* and the very considerable activations of  $\text{Fe}^{III}$  citrate and tartrate are due to degradation products of these acids. (IV) has only a small activating action.  
P. W. C.

**Phosphorescence of cells and cell products.** A. C. GIESE and P. A. LEIGHTON (Science, 1937, 85, 429).—The results of tests on org. materials of biological origin are recorded.  
L. S. T.

**Classification of biological colloids.** S. J. VON PRZYŁĘCKI (Kolloid-Z., 1937, 79, 129—137).  
F. L. U.

**Calcium content of human milk, as influenced by administration of calcium, irradiated ergosterol, and parathyroid hormone.** L. ROSSI (Clin. pediatr., 1934, 16, No. 10).—The Ca content of milk is increased considerably by feeding parathormone, less by irradiated ergosterol, and not at all by Ca.  
CH. ABS. (p)

**Diffusion of calcium from milk through membranes of varying permeability.** G. SARZANA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1031—1032).—Diffusion of Ca from cow's milk through collodion and parchment membranes against aq. KCl or  $\text{CaCl}_2$  or  $\text{H}_2\text{O}$  indicates the presence of two Ca fractions, one readily diffusible and the other non-diffusible through membranes of low permeability (cf. A., 1936, 1405).  
F. O. H.

**Electrophoresis of the diffusible calcium of milk.** G. SARZANA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1032—1033).—The transport of Ca during electro-dialysis of whole milk and electrophoresis of milk ultrafiltrates or aq.  $\text{CaCl}_2$  + Na citrate + K phosphate at  $p_H < 7$  is to the cathode (cf. Peretti, A., 1935, 698).  
F. O. H.

**Micro-determination of potassium and sodium in milk.** M. SATO and K. MURATA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 318—322).—K is determined in the deproteinised milk (5 c.c.) by pptn. as K cobaltinitrite, which is dissolved in  $\text{HNO}_3$  and then reduced with dimethylglyoxime and  $\text{Na}_2\text{S}$ , the colour thus produced being compared with a standard. Na is determined by pptn. as pyroantimonate, which is dissolved in conc. HCl and titrated iodometrically.  
J. N. A.

**Microphotographic study of the fat globules of the milk of Indian breeds of cows and buffaloes.** Z. R. KOTHAVALLA and S. D. SUNAWALA (Indian J. Vet. Sci., 1937, 7, 8—14).—Buffalo milk contains a smaller no. but larger sized fat globules than cow's milk and is more suitable for butter and ghee making. Draught cows give less milk containing more globules of a more uniform size than milch cows. The milch breeds do not show marked variation in the no., size, and shape of globules.  
W. L. D.

**Less-known constituents of milk and their examination. Curdling of milk: the curdling enzyme. Oxidation-reduction systems in milk.**—See B., 1937, 611.

**Comparison of the chemical composition of stimulated and resting saliva of caries-free and caries-susceptible children.** J. WHITE and R. W. BUNTING (Amer. J. Physiol., 1936, 117, 529—532).—There is no apparent difference in composition between salivas from the two classes. Ca and P in resting salivas are  $>$  in stimulated salivas, whilst  $\text{CO}_2$  is less.  
R. N. C.

**Lysozyme content of tears.** W. M. JAMES (Amer. J. Ophthalmol., 1935, 18, 1109—1113).—No relation was apparent between the bacteriolytic titre (*M. lysodeikticus*) of tears and the age, sex, or race of the subject.  
CH. ABS. (p)

**Hepatic excretion in man of bile acids after oral administration.** H. DOUBLET (Proc. Soc.

Exp. Biol. Med., 1937, 36, 50—52).—Oral administration of cholic acid is more effective than that of deoxycholic acid in raising the concn. and total output of bile acids in hepatic bile.  
P. G. M.

**Viscosity of bile solutions.** C. ACHARD, A. BOUTARIC, and P. BERTHIER (Compt. rend., 1937, 204, 1049—1051).—A table summarises the relative  $\eta$  at 26° of varying dilutions of centrifuged ox bile in  $H_2O$ .  
P. W. C.

**Validity of fractional gastric analysis.** F. A. HELLEBRANDT and E. BROGDON (Amer. J. Digest. Dis. Nutrition, 1935, 2, 402—408).—The secretory response of the stomach in normal subjects varied considerably irrespective of the stimulant used (oatmeal, EtOH, histamine). Fractional gastric analysis is of doubtful val. in quant. studies of gastric function but is preferable for detection of acidity or secretory capacity.  
CH. ABS. (p)

**Autoregulation of gastric secretion.** J. J. DAY and D. R. WEBSTER (Amer. J. Digest. Dis. Nutrition, 1935, 2, 527—531).—Introduction of dil. HCl or dil. gastric juice into the duodenum inhibits gastric secretion. Passage of acid chyle from stomach to duodenum probably restricts the secretion.  
CH. ABS. (p)

**Role of the duodenal secretions in the prevention of experimental jejunal ulcer.** C. M. WILHELMJ, F. T. O'BRIEN, H. H. MCCARTHY, and F. C. HILL (Amer. J. Physiol., 1936, 117, 79—85).  
R. N. C.

**Role of duodenal regurgitation in the automatic regulation of the gastric acidity.** C. BOLTON and G. W. GOODHEART (J. Physiol., 1936, 87, 360—387).—Total acidity and total Cl' in the contents of the isolated secreting stomach of the cat increase steadily and at the same rate, although the gastric mucus tends to exert a neutralising effect. Arrest of secretion by atropine flattens both curves, but the action of mucus on emptying the stomach is exaggerated. Cl' in specimens from the fundus is slightly > in those from the pyloric end, but the acidity is the same in both portions. Acid secretion occurs in the fundus, and if the pyloric portion is ligatured from the fundus, its contents remain neutral. If the pylorus is left open, the acidity is automatically kept below 0.05—0.06N by regurgitation of the duodenal contents at this val. The neutralisation takes place in the duodenum.  
R. N. C.

**Regulation of reaction of the acid-base equilibrium in normal urine.** C. DIENST (Arch. exp. Path. Pharm., 1937, 184, 547—557).—The conditions for excretion of non-volatile acids in the urine as  $NH_4$  or Na salts are examined. Excretion as  $NH_4$  salts occurs only when the diet contains excess of protein and as Na salts only when it contains excess of base. If the diet contains excess of acid and is deficient in protein, the acid is excreted by carnivora as  $NH_4$  salts,  $NH_3$  being derived from fixed protein, and retention of Na occurs. At still higher acidity, Na is also utilised for excretion of acid, the alkaline reserve decreasing but excretion is still predominantly as  $NH_4$  salts. Under these conditions with herbivora, the results are similar but the loss of Na is greater.  
P. W. C.

**Emotional change in urinary  $p_H$  in airmen.** A. MANGIACAPRA (Boll. Soc. ital. Biol. sperim., 1937, 12, 14—16).—The urinary  $p_H$  increases (by up to >1.0) during the flight of inexperienced airmen and those of a certain psychological type.  
O. H.

**Urinary  $p_H$  as a function of fatigue in airmen.** A. MANGIACAPRA (Boll. Soc. ital. Biol. sperim., 1937, 12, 17—19).—The urinary  $p_H$  decreases (by 0.2—0.8) during prolonged flights to an extent depending on the duration of flying and the personal reaction of the airmen.  
F. O. H.

**Incidence of non-diabetic glycosuria.** B. Y. GLASSBERG (J. Lab. Clin. Med., 1935, 21, 152—156).—No relation was apparent between the blood-sugar level and the appearance of sugar in urine. In non-diabetic glycosuria blood-sugar is <0.1% and sugar is found in urine 3 hr. after ingestion of 100 g. of sucrose. In diabetics blood-sugar is >0.15% after 3 hr.  
CH. ABS. (p)

**Glomerular filtration and urea excretion in relation to urine flow in the dog.** J. A. SHANNON (Amer. J. Physiol., 1936, 117, 206—225).—Creatinine (I) clearance is essentially const. and independent of the urine flow. At the highest flow obtainable about 40% of the urea filtered is reabsorbed, this fraction increasing as the flow decreases; the increase  $\propto$  the logarithm of the (I)/urea plasma ratio. Urea clearance shows a transient rise relative to (I) clearance during diuresis following a low urine flow; the increase is evoked by osmotic diuresis in normal or pituitrinised animals, and by  $H_2O$  diuresis in normal animals. The concept of an augmentation limit cannot be applied to urea excretion in dogs.  
R. N. C.

**Accuracy in the measurement of the urea excretion-constant (Ambard's constant).** S. DOMBROWSKI, B. DEHRYNG, and Z. STOLZMANN (Bull. Soc. Chim. biol., 1937, 19, 466—489).—Calculations are made of the degree of precision required in measurements of urea levels in plasma and urine, and of the vol. of urine, to evaluate Ambard's const. with an accuracy of 1%. Measurements are made of the const. for young men.  
E. A. H. R.

**Lytic principle of urine in urinary *B. coli* [infection].** A. ALKSNI (Compt. rend. Soc. Biol., 1935, 125, 29—31).—The principle is present in renal lithiasis and hydronephrosis or during vaccination with anacolon vaccines.  
H. G. R.

**Xanthurenic acid, kynurenic acid, and kynurenine.**—See A., II, 305.

**Origin of faecal fat in the absence of bile, studied with deuterium as an indicator.** A. SHAPIRO, H. KOSTER, D. RITTENBERG, and R. SCHOENHEIMER (Amer. J. Physiol., 1936, 117, 525—528).—Fat in the faeces of patients with bile fistulae is increased during the periods when bile does not enter the intestinal tract. About 65—70% of D-containing fat added to the diet is absorbed by the intestine in absence of bile; the increase of faecal fat is due to fats secreted into the intestinal lumen.  
R. N. C.

**Non-specific protein therapy.** R. L. CECIL (J. Amer. Med. Assoc., 1935, 105, 1846—1854).—A review.  
CH. ABS. (p)

**Phosphorus of blood. IV. Phosphorus partition in blood of children with disease.** G. STEARNS and E. WARWEG (Amer. J. Dis. Children, 1935, 50, 1164—1172; cf. A., 1936, 1401).—In infants with tetany as also with rickets there is diminution of ester-P (I) in corpuscles and increased plasma-phosphatase. In malnutrition and osteoporosis (I) in corpuscles is decreased but to a smaller extent. In osteomyelitis (I) increases in serum and often decreases in corpuscles. Acute renal disturbance modifies all forms of P. CH. ABS. (p)

**Sex differences in anæmic rats.** H. H. MITCHELL and T. S. HAMILTON (Science, 1937, 85, 364—366).—Experiments involving complete control of food and supplement intake by paired rats confirm the results of Nevens and Shaw (*ibid.*, 1930, 72, 249), and show that the response of anæmic rats to metallic supplements is modified by the rate of consumption of the basal aminogenic diet so that the more the diet is consumed the slower is the regeneration of hæmoglobin. The sex difference noted by Smith and Otis (this vol., 122) may be the result of a greater intake of basal diet by male rats, and merely a sequel of the well-established difference in growth impulse between the sexes. L. S. T.

**Ancylostoma anæmia.** M. M. FIKRI and P. GHALIOUNGUI (Lancet, 1937, 232, 800—802).—No increase in blood vol. was found in anæmia due to infestation with ancylostoma; there may be a tendency to diminution. The glucose tolerance curves in a certain proportion of these cases showed some abnormality in the extent of the hyperglycæmic response. Blood-sugar curves after intravenous injection of glucose were normal. L. S. T.

**Suitability of experimental anæmias as a test for antianæmic substances. IV. Collargol-saponin anæmia of rats as a quantitative test for injected liver preparations.** P. GOTTLIBE and J. KRAUSE (Arch. exp. Path. Pharm., 1937, 184, 229—234).—The conditions are outlined for rendering suitable the collargol-saponin anæmia of rats and rabbits for evaluation of injected liver extracts. P. W. C.

**Lipin and mineral distribution of serum and erythrocytes in hæmolytic and hypochromic anæmias of childhood.** B. N. ERICKSON, H. H. WILLIAMS, F. C. HUMMEL, P. LEE, and I. G. MACY (J. Biol. Chem., 1937, 118, 569—598).—There is a marked rise in the neutral fat fraction of plasma-lipins in erythroblastic anæmia, whilst Cl' is normal, Na' low, and K' more variable than normal. In the erythrocytes, variations of concn. and distribution are dependent on the type of anæmia, and the resistance to hæmolysis by saponin or hypotonic aq. NaCl is related to the shape and fragility of the corpuscles. The % of EtOH-sol. phospholipins of plasma (90—95%) in hæmolytic anæmia is similar to that of normal children, but is lower (84%) in hypochromic anæmia; in hæmolytic anæmia, the phospholipins of the erythrocytes (63%) are < normal (80%). P. G. M.

**Reticulocyte responses in the pigeon produced by material effective and non-effective in pernicious anæmia: histologically different re-**

**actions of bone marrow.** G. L. MULLER (New England J. Med., 1935, 213, 1221—1226).—Injection of active liver extracts caused an increase in reticulocytes, and changes in megaloblastic bone marrow similar to those produced by treatment of pernicious anæmia. Intravenous injection of lysine or leucine causes a similar reticulocyte response, and growth and extension of erythroblastic tissue in bone marrow. CH. ABS. (p)

**Lipin and mineral distribution of serum and erythrocytes in pernicious anæmia (before and after treatment).** H. H. WILLIAMS, B. N. ERICKSON, S. BERNSTEIN, F. C. HUMMEL, and I. G. MACY (J. Biol. Chem., 1937, 118, 599—618).—Serum-minerals are unaffected in pernicious anæmia but the lipins contain an increased amount of neutral fat and are deficient in cholesteryl esters (I) and phospholipins (II). The erythrocytes contain an excessive amount of (I) and are deficient in free cholesterol and (II); K' and hæmoglobin are also increased. Therapy produces a return to normal vals. P. G. M.

**Gastric acidity in chronic arthritis.** E. F. HARTUNG and O. STEINBROCKER (Ann. Intern. Med., 1935, 9, 252—257).—Subacidity is an important factor in the chemical picture of chronic arthritis. CH. ABS. (p)

**Use of helium in the treatment of asthma and obstructive lesions in the larynx and trachea.** A. L. BARACH (Ann. Intern. Med., 1935, 9, 739—765).—A mixture of He 80 and O<sub>2</sub> 20% has  $\frac{1}{3}$  the wt. of a comparable vol. of air. Inhalation of the mixture decreases pulmonary ventilation and pressure, and the length of extirpation and increases the rest period between cycles. CH. ABS. (p)

**Cobalt—an essential element.** (A) R. A. GORTNER. (B) H. G. DENHAM (Science, 1937, 85, 382—383, 383).—(A) A correction.

(B) The use of Co drenches giving 8 mg. of Co per week prevents and cures sheep ailment in New Zealand. The curative properties of drench materials etc. previously used with success has depended not on the Fe content but on a relatively high Co content. Purified Fe<sup>III</sup> NH<sub>4</sub> citrate is not effective in controlling bush sickness. In New Zealand a low Co soil status is associated with stock ailment. The liver, pancreas, and blood of affected sheep contain much less Co than the corresponding organs from healthy animals. L. S. T.

**Chemical factors in the ætiology of cancer.** J. W. COOK (Bull. Soc. chim., 1937, [v], 4, 792—804).—A lecture.

**Cancer-producing chemical compounds.** C. L. HEWETT (Current Sci., 1937, 5, 527—530).—A review.

**Carcinogenic action of dibenzcarbazoles.** E. BOYLAND and A. M. BRUES (Proc. Roy. Soc., 1937, B, 122, 429—441).—3:4:5:6-Dibenzcarbazole (I) exhibits strong and 1:2:5:6- and (especially) 1:2:7:8-dibenzcarbazole exhibit less pronounced carcinogenic activity when painted on mice;  $\alpha\alpha$ - and  $\beta\beta$ -dinaphthylamines, *o*-aminoazotoluene, and chrysoidine exhibit no such effect. (I) produces hypertrophic biliary changes and a condition resembling hepatoma. W. McC.

**Effect of polycyclic hydrocarbons on the growth rate of transplantable tumours.** A. HADDOW and A. M. ROBINSON (Proc. Roy. Soc., 1937, B, 122, 442—476).—The rate of growth of Jensen sarcoma, Walker carcinoma, Rous sarcoma, and of tumours produced by carcinogenic hydrocarbons is inhibited by carcinogenic compounds (e.g., 1 : 2 : 5 : 6-dibenzanthracene, 3 : 4-benzpyrene) and by compounds such as chrysene and benzantracene derivatives which have only slight or no carcinogenic power. Certain related non-carcinogenic compounds have no inhibiting effect. The oestrogenic compound 9 : 10-dihydroxy-9 : 10-dipropyl-9 : 10-dihydro-1 : 2 : 5 : 6-dibenzanthracene has an inhibiting effect but 1-keto-1 : 2 : 3 : 4-tetrahydrophenanthrene has none. W. McC.

**Effect of carcinogenic and other hydrocarbons on body growth in the rat.** A. HADDOW, C. M. SCOTT, and J. D. SCOTT (Proc. Roy. Soc., 1937, B, 122, 477—507).—Immediate, long-continued reduction in the rate of growth of young rats is produced by intraperitoneal administration of carcinogenic (e.g., 1 : 2 : 5 : 6-dibenzanthracene) but not by that of non-carcinogenic hydrocarbons (e.g., pyrene). Temporary reduction in the rate is also produced by X-ray irradiation,  $\text{Pb}(\text{NO}_3)_2$ , and colchicine. W. McC.

**Effect of 1 : 2 : 5 : 6-dibenzanthracene on spontaneous mouse tumours.** F. C. PYBUS and E. W. MILLER (Brit. J. Exp. Path., 1937, 18, 126—137).—Evidence was obtained that the carcinogenic action of this substance is "reversible" in the same sense as that of radiation. Intraperitoneal injection of colloidal preps. caused arrest of growth in some cases and regression in others. Sarcoma and leucæmia were unaffected and the formation of new tumours was in no case prevented. R. M. M. O.

**Carcinogenic action of methylcholanthrene.** P. VALADE (Compt. rend., 1937, 204, 1281—1282).—Rats receiving repeated intratracheal injections of 0.1 c.c. of 0.2% methylcholanthrene in oil at intervals of 5 days showed carcinomatous growths in the trachea or oesophagus in 28% of cases. Macroscopic growths developed in 25 days to 5 months and showed, histologically, a wide variety of form. J. L. D.

**Gonadotropic hormone (prolan) in relation to carcinoma of the cervix.** J. A. HALSTED (New England J. Med., 1935, 213, 803—805).—In carcinoma of the cervix uncomplicated by ovarian deficiency, increased contents of the hormone appeared in the urine of 4 out of 15 cases. CH. ABS. (p)

**Hyperinsulinism associated with calcified tumour of the pancreas.** S. F. HERMANN and J. A. GRUS (J. Amer. Med. Assoc., 1937, 108, 1402—1405).—A case of hyperinsulinism associated with a calcareous pancreatic tumour without gross adenomatous islet tissue is described. This was cured by operative removal. H. G. R.

**Cataracts and dinitrophenol.** D. G. COGAN and F. C. COGAN (New England J. Med., 1935, 213, 854—856).—Cataract following use of dinitrophenol is probably caused by tissue anoxæmia leading to damaged lens epithelium. CH. ABS. (p)

**Phenolsulphonephthalein in hepatic cirrhosis.** G. PECO and F. I. FERREIRA (Rev. assoc. med. argentina, 1935, 49, 1265—1268).—In some cases of liver disturbance renal elimination of phenolsulphonephthalein is diminished. CH. ABS. (p)

**Influence of dextrin and sucrose on growth and dermatitis.** R. C. BENDER, S. ANSBACHER, G. E. FLANIGAN, and G. C. SUPPLEE (J. Nutrition, 1936, 11, 391—400).—Basal rations containing sucrose (I) but not those containing dextrin (II) induced dermatitis in rats. Vitamin-B and lactoflavin (III) used as supplements to the (I) diet did not prevent dermatitis or permit normal growth; with the (II) ration these supplements substantially increased growth rates. Extracts of rice polishings corr. the (I) ration provided adequate amounts of -B and (III) were given. Dermatitis was delayed by addition of 10% of hydrogenated vegetable oils to the (I) diet.

**Restoration of carbohydrate oxidation in diabetic tissue *in vitro*.** E. SHORR (Science, 1937, 85, 456—458).—The respiratory quotients of excised cardiac tissue of diabetic dogs following prolonged incubation in Ringer-glucose-phosphate solution at 37.5° have been determined. With prolonged incubation under these conditions a definite change in metabolism of the tissue occurs, and the capacity to oxidise carbohydrate becomes like that of normal cardiac tissue. L. S. T.

**Unusual glycogen storage in a case of diabetes mellitus.** E. W. BRIAN, H. J. SCHROETER, and E. L. PERSONS (Arch. Int. Med., 1937, 59, 685—690).—The liver contained a large amount of glycogen. R. M. M. O.

**Relation of diet to goitre. III. A goitrogenic diet.** R. E. REMINGTON and H. LEVINE (J. Nutrition, 1936, 11, 343—357; cf. A., 1933, 1322).—Direct correlation is established between the size and I content and between the size and dry matter content of the thyroid gland. Storage of I by rats during the first 4 weeks of life is insufficient to prevent goitre when a low-I diet is given for 5 weeks. The extent of goitre produced was not significantly affected by the Ca content or Ca : P ratio of the diet or by the presence or absence of vitamin-D. A. G. P.

**Goitre and water supplies in Holland.** J. F. REITH (Water, 1933, 17, 1—13).—Incidence of goitre and the I content of foods, waters, and soils are reciprocally related. Addition of 10 mg. of KI per kg. of table salt permits an intake of 30 mg. of I per year without danger of I poisoning. CH. ABS. (p)

**Biochemistry of iodine.** S. MIHOLIC (Bull. Soc. Chim. Yougoslav., 1936, 7, 133—140).—A correlation is established between incidence of goitre and low I content of the soil in Croatia, except for an area between the Drave and the Sava, characterised by a low I content of the soil, in which no case of goitre has been reported. R. T.

**Von Gierke's glycogen disease.** L. M. LINDSAY, A. ROSS, and F. W. WIGGLESWORTH (Ann. Intern. Med., 1935, 9, 274—281).—In this disease sufficient

amylase occurs in liver, blood, and urine, but appears unable to produce glucose from glycogen.

CH. ABS. (p)

**Quinine test for hyperthyroidism.** I. BRAM (J. Lab. Clin. Med., 1935, 21, 123—127).—Tolerance of quinine increases in hyperthyroidism to extents which  $\propto$  the basic metabolic rate. The diagnostic test is described.

CH. ABS. (p)

**Icterus index in the newborn infant.** B. E. BONAR (Amer. J. Dis. Children, 1935, 50, 1143—1145).—Hyperbilirubinæmia exists at birth and continues for the first 12 days irrespective of the presence of clinical jaundice. Changes in the icterus index with growth are examined.

CH. ABS. (p)

**Reactions to non-specific protein treatment of infectious diseases.** L. HEKTOEN (J. Amer. Med. Assoc., 1935, 105, 1765—1767).—Effects of non-sp. proteins are probably due to activation of non-sp. as well as sp. anti-infectious body processes.

CH. ABS. (p)

**Blood-cholesterol and -lecithin in leprosy.** V. CHORINE (Compt. rend. Soc. Biol., 1937, 124, 1276—1278).—The ratio lecithin:cholesterol is  $>1$  in infected, and  $<1$  in healthy, rats, the increase not being parallel to the severity of the symptoms.

H. G. R.

**Detection of mastitis.** A. O. SHAW, H. C. HANSEN, and R. C. NUTTING (J. Dairy Sci., 1937, 20, 199—203).—Tests for hæmolytic bacteria, cell count, Cl content, and  $p_H$  showed the presence of streptococci in 92.5% of samples from cows giving abnormal milk, in 37% of samples from cows having milk chronic mastitis, and in 7.1% in normal cow's milk. The incidence of hæmolytic bacteria was 82.5, 25.0, and 1.9, and of cells  $>100,000$  per ml. 87.7, 27.7, and 5.8%, respectively. Tests for Cl and  $p_H$  were unreliable.

W. L. D.

**Biochemical observations in a case of progressive ossifying myositis, before and after parathyroidectomy.** M. SAVIANO and C. TANGARI (Arch. Ist. Biochim. Ital., 1937, 9, 57—80).—The course of the disease was not significantly affected by parathyroidectomy.

F. O. H.

**Chronic nephritis in rats fed with high-protein diets.** N. R. BLATHERWICK and E. M. MEDLAR (Arch. Int. Med., 1937, 59, 572—596).—The condition was produced especially by diets with high animal protein, casein being less effective than liver or muscle. The ætiological factor may not be protein but is certainly either a substance in the food or one produced from it in metabolism.

R. M. M. O.

**Carbohydrate metabolism in pregnancy.** B. J. MORA GUES (Día med., 1934, 6, 497).—In pregnancy there are factors which modify normal glucoregulation and which differ from those observed in non-pregnant conditions. Marked hypoglycæmia is due to latent or apparent hepatic insufficiency.

CH. ABS. (p)

**Habitual abortion and stillbirth syndrome and late pregnancy toxæmia. Vitamin-E and the prolan-progesterone mechanism.** J. YOUNG (Brit. Med. J., 1937, 953—957).—The syndrome is discussed in relation to vitamin-E and the prolan-

progesterone mechanism in pregnancy. Results of prolan therapy are recorded.

A. G. P.

**Blood-urea in experimental rabies in the dog and rabbit.** P. REMLINGER and J. BAILLY (Compt. rend. Soc. Biol., 1937, 125, 220—222).—An increased val., reaching a max. at death, was observed.

H. G. R.

**Healing of rickets in rats on a diet containing negligible amounts of calcium and vitamin-D.** J. H. JONES and B. N. E. COHN (J. Nutrition, 1936, 11, 293—302).—Rachitic rats transferred to a diet containing adequate P but only traces of Ca and vitamin-D showed, after an initial period of disturbance, healing of rachitic lesions and a slight increase in femur ash. Ca and bone salts were probably transferred from calcified to rachitic parts of the skeleton. This process was unaffected by supplementary feeding of irradiated ergosterol.

A. G. P.

**Influence of parasitism on the mineral equilibrium of the tissues (sacculine in crabs).** A. DRILHON (Compt. rend., 1937, 204, 913—915; cf. A., 1936, 876).—The Ca and Mg contents of the claw muscles of crabs (*Carcinus maenas*) are about 4 and 3 times as great respectively in sacculinised as in normal crabs; K and Na remain unchanged. In the parasite itself, the % of Ca is similar to, and that of Mg, K, and Na  $>$ , that in normal crabs.

F. A. A.

**Dosage of moranyl in treatment of gambiense sleeping sickness.** A. SICE and H. MERCIER (Trop. Dis. Bull., 1935, 32, 21—22).—Oral or intravenous administration of moranyl (I) produced a degree of sterilisation similar to that obtained with orsanine but caused marked albuminuria. Combined use of (I) and tryparsamide gave better results than either alone.

CH. ABS. (p)

**Derivatives of *p*-aminobenzenesulphonamide in the treatment of streptococcal infection in mice.**—See A., II, 302.

**Tetany of œstrus in the parathyroidectomised dog.** E. I. EVANS, S. SZUREK, and R. KERN (Amer. J. Physiol., 1936, 117, 405—410).—Ca,  $PO_4$ , Na, K, Cl,  $CO_2$ , and  $p_H$  show no apparent change in the blood of normal bitches during the œstrus cycle. Tetany may occur in a parathyroidectomised bitch coming into natural œstrus in the latent tetany period if serum-Ca is low or comparatively normal.

R. N. C.

**Nature of the resistance to treatment shown by some cases of bovine trypanosomiasis.** H. E. HORNBY (Tanganyika Ann. Rep. Dept. Vet. Sci., 1934, 37—39).—In treatment of *T. congolese* infection with Sb compounds it is unlikely that Sb reaches and kills all trypanosomes in the body. Complete sterilisation depends on subsequent antibody action. Refractoriness to treatment results from failure of the host to produce the antibody rather than to special resistance of the parasite to the drug.

CH. ABS. (p)

**Nitrogen and mineral metabolism in *Trypanosoma congolese* disease.** M. H. FRENCH (Tanganyika Ann. Rep. Dept. Vet. Sci., 1934, 59—64).—Infection of cattle with *T. congolese* increases the rate of

excretion of N, Ca, K, and P, but not of Mg. The effects on Na and Cl metabolism depend on the level of intake. Pica developing during the disease represents an attempt to correct excessive loss of minerals and to neutralise the resulting acidosis.

CH. ABS. (p)

**Mechanism of healing in collapse therapy.** M. PINNER (Ann. Intern. Med., 1935, 9, 501—515).—Reduced  $O_2$ - and increased  $CO_2$ -tension may produce conditions unfavourable to the tubercle bacillus.

CH. ABS. (p)

**Chemotherapy of tuberculosis.** H. SCHLOSS-BERGER (Angew. Chem., 1937, 50, 407—409).—In tuberculosis, chemotherapeutic agents probably act wholly directly or partly directly, partly by stimulation of the defensive mechanism of the infected organism. Those org. Au compounds which sometimes have beneficial effects probably weaken but do not kill the bacilli and hence require the co-operation of this mechanism.

W. McC.

(A) **Variations in the blood-sugar and glycogen reserves during experimental uræmia in the rabbit.** M. VILLARET, L. JUSTIN-BESANÇON, A. RUBENS-DUVAL, and P. BARBIER. (B) F. RATHERY (Compt. rend. Soc. Biol., 1937, 125, 266—268, 268—269).—(A) Free sugar (I) rises slightly and then returns to normal, whereas protein-bound (I) rises progressively with a consequent decrease in hepatic and muscular glycogen reserves.

(B) Previous work (A., 1931, 1181) utilising the dog confirms these results except that variations in the free (I) were irregular.

H. G. R.

**Adequacy of the chemical theory of smooth muscle excitation.** A. ROSENBLUETH and W. B. CANNON (Amer. J. Physiol., 1936, 116, 414—429).

R. N. C.

**Chemical activity of nerves.** (A) Q. CALABRO. (B) G. BERGAMI (Arch. Ist. Biochim. Ital., 1937, 9, 99—104, 105—119).—(A) The conclusions of Bergami and collaborators (cf. A., 1936, 1413; this vol., 178) are criticised.

(B) A reply. Further evidence for the author's theory is given.

F. O. H.

**Pancreas and general metabolism.** W. N. BOLDYREFF (Amer. J. Digest. Dis. Nutrition, 1935, 2, 413—415).—Pancreatic enzymes control the carbohydrate, fat, and protein metabolism of the whole body and of each individual cell. There is evidence that the pancreas is the principal agent in all general chemical processes of the organism.

CH. ABS. (p)

**Technique for metabolism studies in pre-school children: statistical determination of its reliability.** J. E. HAWKS, M. DYE, and M. M. BRAY (J. Nutrition, 1937, 13, 51—64).—The method is described and the range of variation in composition of prepared experimental diets is determined.

A. G. P.

**Basal metabolism of Wyoming University women.** E. J. MCKITTRICK (J. Nutrition, 1936, 11, 319—325).—Living at high altitudes (7000 ft.) raises the level of basal metabolism.

A. G. P.

**Blood-cholesterol in disturbances of the basal metabolic rate.** L. C. MCGEE (Ann. Intern. Med.,

1935, 9, 728—738).—No correlation was apparent between blood-cholesterol (I) and basal metabolic rate or the condition of the patient. Thyroid disease is accompanied by changes in (I), and determinations in plasma may be of val. in following the progress of treatment.

CH. ABS. (p)

**Specific dynamic action of protein and ammonia production using the isolated kidney.** K. OBERDISSE and M. ECKARDT (Arch. exp. Path. Pharm., 1937, 184, 109—125).—When alanine (I) is administered to the isolated dog's kidney prep. 79% increase in  $O_2$  utilisation occurs and with glycine 38.9% increase. A small amount of (I) is excreted in the urine and part is deaminated, the  $NH_3$  production with (I) increasing by 14 times.  $AcCO_2H$  causes an increase of 80% in  $O_2$  utilisation. Deamination has no importance, therefore, in respect of the sp. dynamic effect. About 24% of the sp. dynamic effect of  $NH_2$ -acids in the whole animal is due to the two kidneys.

P. W. C.

**Respiratory metabolism in infancy and childhood.** XVI. **Effect of intravenous infusions of fat on the energy exchange of infants.** H. GORDON and S. Z. LEVINE (Amer. J. Dis. Children, 1935, 50, 894—912).—Parenterally administered fats can be oxidised in normal infants if the control level of the R.Q. is 0.9—1.0. Intravenous administration of emulsified fats depressed the R.Q. by 0.03—0.07. Increased heat production due solely to increased fat oxidation occurred. With R.Q. = 0.8 fat oxidation was not increased even if emulsified fat was given orally. Parenterally administered fat had no effect on the R.Q. of the marasmic infant.

CH. ABS. (p)

**Blood-flow and gaseous metabolism of the liver of unanæsthetised dogs.** A. BLALOCK and M. F. MASON (Amer. J. Physiol., 1936, 117, 328—334).

R. N. C.

**Effect of aggregation on the respiratory metabolism of the brown snake *Storeria dekayi*.** H. J. CLAUSEN [with B. MOFSHIN] (J. Cell. Comp. Physiol., 1936, 8, 367—386).— $O_2$  consumption was lower in aggregated than in isolated snakes. Throughout the year vals. for males were > for females.  $O_2$  consumption per unit wt. in gravid females diminished prior to, and increased sharply after, parturition.

M. A. B.

**Respiration of embryo versus egg (Orthoptera).** J. H. BODINE and E. J. BOELL (J. Cell. Comp. Physiol., 1936, 8, 357—366).—During diapause and throughout the first 9 days of development the rate of  $O_2$  consumption is lower in the embryo than in the whole egg, so that data for the intact egg are not applicable to the contained embryo.

M. A. B.

**Rate of tissue metabolism of marine cold-blooded animals in different latitudes.** H. M. FOX and C. A. WINGFIELD (Nature, 1937, 139, 369; cf. A., 1936, 884).—Measurements of the  $O_2$  consumption of isolated muscles of prawns from different latitudes support, in certain cases, the hypothesis that the greater  $O_2$  requirement of English compared with arctic invertebrates, each at the temp. of its habitat, is due to a greater non-locomotory metabolism.

L. S. T.

**Milk and nutrition.**—See B., 1937, 610.

**Effect of feeding egg-yolk on liver-lipins of young rats.** R. OKEY and E. YOKELA (J. Nutrition, 1936, 11, 463—470).—Rats receiving a diet containing egg-yolk sufficient to provide 1% of cholesterol (I), tended to develop fatty livers although the diet contained 2-3% of phospholipins. In females receiving such a diet the accumulation of fat and cholesterol esters was > in those receiving egg-yolk protein, the same level of cholesterol as hydrogenated vegetable oil, but no lecithin. Males store less liver fat and (I) on egg-yolk than on (I)-containing diets.

A. G. P.

**Comparative effects of cod-liver oil, cod-liver oil concentrate, lard, and cottonseed oil in a synthetic diet on development of nutritional muscular dystrophy.** L. L. MADSEN (J. Nutrition, 1936, 11, 471—493).—A basal diet free from fat except the non-saponifiable fraction of cod-liver oil used as a source of vitamin, produced dystrophy to nearly the same extent as the basal diet + 6% of lard. Substitution of cottonseed oil for lard afforded a high degree of protection. Nutritional muscular dystrophy in guinea-pig and rabbit is similar and is characterised by a diminution in creatine and a somewhat increased  $O_2$  consumption of the excised muscle tissue.

A. G. P.

**Nencki's hæmatoporphyrin.** W. HACKER with J. HUNNERFELD (Arch. exp. Path. Pharm., 1937, 184, 723—736).—The hæmatoporphyrin given to man either by mouth or intramuscularly enters the blood stream only in small amounts (<10<sup>-5</sup>%) and is excreted in the fæces to a considerable extent.

P. W. C.

**Biological value of hydrolysed blood-proteins.** V. MARTINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 23—24).—Oral administration of hydrolysed ( $H_2SO_4$ ) serum-proteins (ox) to dogs is accompanied by a negative N balance; intravenously administered, the utilisation is lower. The addition of small amounts of tryptophan also gives a negative balance but increases the biological val. of the hydrolysate.

F. O. H.

**"Reconstructive value" of purified proteins. I, II. Feeding of rats with ovalbumin, caseinogen, gliadin, and gelatin.** L. CIOGLIA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1034—1035, 1035—1036).—I. With diets deficient only in protein, recuperative growth in fasted rats results from daily addition to the diet of <1.6 g. of ovalbumin or caseinogen or 2.4 g. of gliadin whilst 2.4 g. of gelatin does not produce normal growth.

II. The above effect is also shown by the N balance.

F. O. H.

**Urea clearance and protein clearance during exercise.** A. B. LIGHT and C. R. WARREN (Amer. J. Physiol., 1936, 117, 658—661).—Urea clearance in normal young males shows a fall during regulation games; it is independent of the degree of proteinuria, and shows no significant difference according to the nature of the sport.

R. N. C.

**Relation of experimental atherosclerosis to diets rich in vegetable protein.** R. H. FREYBERG (Arch. Int. Med., 1937, 59, 660—666).—In rabbits

diets rich in vegetable protein do not cause either atherosclerosis or hypercholesterolaemia; the latter, however, arises from under-nutrition. The apparent influence of animal protein may thus be due to some accompanying substance.

R. M. M. O.

**Metabolism of glyoxaline. IV. Glyoxalinuria in exogenous protein metabolism.** P. LELU (Bull. Soc. Chim. biol., 1937, 19, 490—495; cf. this vol., 129).—After a protein-rich meal, the initial rise in urinary glyoxaline (I) is relatively > that of total N. The rise in total N persists longer than that of (I), which, after reaching a max., falls rapidly to its original level. Histidine (II) must therefore be detached early in the course of the digestive degradation of proteins. As the (I) level is highest when the coeff. of oxidation of proteins is lowest, it is concluded that (II) has a greater resistance to deamination than other  $NH_2$ -acids.

E. A. H. R.

**Effect of methylene-blue, cystine, and cysteine on the metabolism of the intact animal.** W. GOLDFARB, J. F. FAZIKAS, and H. E. HEMWICH (Amer. J. Physiol., 1936, 117, 631—637).—The R.Q. in rats shows an initial depression, later rises to vals. > the original val., and then returns to the post-absorptive level.

R. N. C.

**Nature of the compounds excreted as a result of the catabolism of the amino-acids.** G. MOUROT (Compt. rend., 1937, 204, 915—917).—Data are given for the effect of 14  $NH_2$ -acids and  $NH_4$  citrate, fed singly as supplements to rats on a carbohydrate diet, on the amounts of various urinary N compounds. The main effect is to increase urea-,  $NH_3$ -, and  $NH_4$ -N. No effect is produced on the excretion of purine or creatinine derivatives; variations in the amounts of creatine are small and irregular.

F. A. A.

**Blood clearance and renal excretion of bile acids following intravenous injection of cholic and deoxycholic acids.** S. S. LIGHTMAN (Amer. J. Physiol., 1936, 117, 665—671).—Cholic acid (I) injected into dogs is promptly removed from the blood, but deoxycholic acid (II) persists for 2 hr. Urinary excretion of bile acids (III) after injection of (I) is > after (II), but only a small fraction of the injected dose is excreted in either case. If the dose of (II) is restricted, (III) may not be excreted in the urine, but blood-(III) are increased. The blood/urinary (III) ratio, when the concn. in either fluid is increased following injection, may acquire a sp. const. val. according as (I) or (II) is injected.

R. N. C.

**Mechanism of the biological synthesis of acetylcholine. I. Isolation of acetylcholine produced by brain tissue *in vitro*.** EDGAR STEDMAN and ELLEN STEDMAN (Biochem. J., 1937, 31, 817—827).—When minced brain was incubated at 37° in the presence of eserine, acetylcholine (I) was formed. The yield of (I) was increased by a preliminary grinding of the tissue with  $CHCl_3$ . (I) was isolated as the double platinichloride of choline and (I), from which (I) aurichloride was subsequently prepared.  $CH_3Ac \cdot CO_2Na$  increased the yield of (I) by 50% and may therefore be a possible precursor of the Ac of (I).  $AcOH$  and  $AcCO_2H$  are not precursors.

E. A. H. R.

**Oxidation of choline by rat's liver.** P. J. G. MANN and J. H. QUASTEL (*Biochem. J.*, 1937, 31, 869—878).—The increase in  $O_2$  uptake following addition of choline (I) to respiring tissue slices is accompanied by disappearance of the (I) and is reversibly inhibited by  $CN'$ . Effects of varying the concn. of (I) and  $CN'$  are described. The oxidation product is probably betainealdehyde (isolated as reineckate and aurichloride), further oxidation with  $Ag_2O$  or  $KMnO_4$  giving betaine.  
R. M. M. O.

**Effect of quantitative underfeeding and of vitamin-A deficiency on tissue lipins of rats fed diets low in cholesterol.** H. L. GILLUM and R. OKEY (*J. Nutrition*, 1936, 11, 303—317).—The size and fatty acid content of livers of rats receiving vitamin-A-deficient diets or insufficient nourishment but with adequate -A supplies were < those of control animals. Livers of undernourished animals contained relatively more free cholesterol (I). Diets low in (I), lecithin, and fat produced low cholesteryl ester (II) concns. in all cases. Subsequent feeding of (I) produced (i) lower % and abs. storage of (II), and a slightly lower phospholipin content in livers of -A-deficient animals, (ii) higher concns. and nearly as high abs. amounts of (II) in the small livers of undernourished rats as in the grossly enlarged livers of control animals.  
A. G. P.

**Effect of administration of squalene and other hydrocarbons on cholesterol metabolism in the rat.** H. J. CHANNON and G. R. TRISTRAM (*Biochem. J.*, 1937, 31, 738—747).—When a diet containing 1% of squalene (I) is administered to rats, the mean increases of liver- and faeces-sterol are 50 and 33%, respectively [the sum representing 1/8 of the (I) given], with no change in carcass-sterol. The liver-sterol increase is in esterified cholesterol (II). When partly hydrogenated (I) is administered, little absorption occurs and the faecal, but not the liver-, sterol is increased. The same result, however, is obtained on feeding *n*-hexadecane, suggesting that the increase is due to unabsorbed hydrocarbon passing through the intestine. The effects of the hydrocarbons are probably not entirely due to solvent action but it appears that they either cause increased production of (II) or interfere with its absorption. (I) administered to captive cod appears in the liver but does not cause an increase in liver-sterol. No definite conclusion is possible but the balance of evidence suggests that (I) is not converted into (II).  
P. W. C.

**Fat metabolism. X. Fate of triglycerides of saturated monobasic acids in dogs.** P. E. VERKADE, J. VAN DER LEE, and A. J. S. VAN ALPHEN (*Z. physiol. Chem.*, 1937, 247, 111—114; cf. *A.*, 1934, 441; 1936, 234).—The feeding of the triglycerides of the acids  $C_7$ — $C_{11}$  to a dog resulted in the appearance in the urine of appreciable amounts of dicarboxylic acids only in the case of the  $C_8$  acid (cf. Flaschenträger and Bernhard, *A.*, 1936, 510).  
W. McC.

**Fat metabolism in fishes. XI. Specific peculiarities in depot fat composition.** J. A. LOVERN (*Biochem. J.*, 1937, 31, 755—763; cf. *A.*, 1936, 1544).—The differences between fats of

fresh-water and marine species are expressed graphically, indicating the probable average unsaturation of fats ingested by most species. The fats show sp. peculiarities in the degree of unsaturation of one or more of the acid groups, in the proportions of their acids (*e.g.*, acids of lower mol. wt. being suppressed or increased), in the content of a particular acid, or in a neutralisation effect due to the animal's habit of both sea- and fresh-water feeding. Examples are given.  
P. W. C.

**Is the alimentary unbalance caused by fatty acids of high m.p. (above 50°) of the same order as that produced by liquid fatty acids at body temperature?** R. LECOQ (*Compt. rend.*, 1937, 204, 1001—1003; cf. *A.*, 1935, 1015; 1934, 687; 1933, 872).—Mixed fatty acids (stearic 50, palmitic 40, and oleic acid 10%) (22 parts) or their K salts, in a diet containing in addition muscle-peptone 59, butter fat 4, salt mixture 5, agar and filter-paper 10 parts, when fed to pigeons does not protect against polyneuritis even when a daily dose of 3 g. of dried yeast is administered. 2% of glycerol in the diet somewhat ameliorates the condition. Disturbance caused by feeding solid acids is similar to that by liquid acids and is probably due to formation of rapidly assimilable soaps in the intestines.  
J. L. D.

**Effect of cellulose, hemicellulose, and lignin on the weight of the stools.** R. D. WILLIAMS and W. H. OLMSTED [with C. H. HAMANN, J. A. FIORITO, and D. DUCKLES] (*J. Nutrition*, 1936, 11, 433—449).—During passage through the digestive tract, the relative decomp. of hemicellulose (I), cellulose (II), and lignin (III) decreased in the order named. The vol. of faeces was influenced by the amount of (I) and (II) decomposed in the tract > by the amount of residue [(I) + (II) + (III)] fed or the amount present in the faeces. High proportions of volatile fatty acids in faeces are associated with extensive decomp. of (I) and (II).  
A. G. P.

**Utilisation of fructose in the mammalian organism as shown by experiments on hepatectomised and eviscerated preparations.** J. P. GRIFFITHS and E. T. WATERS (*Amer. J. Physiol.*, 1936, 117, 134—141).—Fructose (I) is utilised and can prolong life in dogs deprived of their liver and viscera. Injection of a large quantity of (I) is not followed by an increase in blood-glucose, showing that (I) can be oxidised directly by tissues, without previous conversion into glucose.  
R. N. C.

**Speed of absorption following the ingestion of glucose and of sucrose.** A. C. ROBERTS (*Amer. J. Physiol.*, 1936, 117, 257—260).—Blood-sugar in dogs after ingestion of glucose tends to be > after sucrose, possibly through more rapid absorption.  
R. N. C.

**Utilisation of hexoses by excised rat tissues.** M. E. MARSH (*J. Nutrition*, 1937, 13, 109—112).—Addition of fructose (I) to Ringer phosphate solution increased the  $O_2$  consumption and R.Q. of kidney tissue placed therein. Glucose (II) produced a smaller and galactose (III) no effect. Muscle tissue oxidised neither (I) nor (II). Liver tissue did not oxidise (II) or (III) but acted on (I), although in this

case other processes than oxidation (possibly conversion into fat) are probably concerned. A. G. P.

**Utilisation and tolerance of the monosaccharides.** J. GARCIA-BLANCO (Día méd., 1934, 6, 1099).—Fructose, galactose, and mannose are converted into glucose (I) before utilisation. (I) appears in urine soon after its circulation in blood. Xylose is absorbed slowly, its hepatic retention is very low, its utilisation small, and its elimination by the liver easy. CH. ABS. (p)

**Chemical processes during contraction of muscle under high pressure.** H. J. DEUTICKE and U. EBBECKE (Z. physiol. Chem., 1937, 247, 79—103).—Transformations occurring during the contraction of the frog gastrocnemius suspended in oil and exposed for 2 sec. to 40 min. to pressures of 300—1500 atm. are the same as those which occur in untreated muscle but vary in extent with the magnitude and duration of the pressure. Pressure of 300 atm. accelerates and extends decomp. of phosphocreatine (I) but only slowly affects the glycogen, lactic acid (II), and inorg.  $\text{PO}_4'''$  contents. Pressure of 500 atm. greatly accelerates (I) decomp. and increases (II) production. Lengthy exposure to pressure causes decomp. of  $\text{P}_2\text{O}_7'''$ . Synthesis of hexose monophosphate in the exposed muscle begins early, reaches its max. very slowly, and is detected even after exposure to pressure has been of such duration that irreversible damage to the muscle has occurred. W. McC.

**Acid-soluble phosphates of muscle following injection of glucose plus insulin.** G. T. CORI and C. F. CORI (Proc. Soc. Exp. Biol. Med., 1937, 36, 23—27).—Following injection of glucose + insulin, serum- $\text{PO}_4'''$  increases, but no change in org. acid-sol. P of muscle occurs. P. G. M.

**Phosphorylation in kidney tissue.** H. KALCKAR (Enzymologia, 1937, 2, 47—52; cf. A., 1936, 1420).—Kidney cortex phosphorylates large amounts of glucose (I) after inhibition of dephosphorylation by  $\text{F}^-$ . Phosphorylation is reversibly inhibited under anaerobic conditions, suggesting a coupled reaction between the phosphorylation and the  $\text{O}_2$  consumption. 1 mol. of P reacts with (I) for each mol. of  $\text{O}_2$  absorbed.  $\text{CN}^-$  inhibits phosphorylation and respiration equally but phloretin and  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  have a greater effect on phosphorylation. The phosphorylation product is fructose diphosphate and the  $\text{O}_2$  consumption is independent of phosphorylation. A similar accumulation of phosphoric esters occurs in liver tissue poisoned with  $\text{F}^-$ . E. A. H. R.

**Oxidation of  $\beta$ -hydroxybutyric acid in the kidneys.** A. ROSSI (Boll. Soc. ital. Biol. sperim., 1937, 12, 10—11).—In presence of slices of surviving kidney (guinea-pig, rat), the acid is oxidised (optimum  $p_{\text{H}}$  7.2—7.3) but to an extent < that for  $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$  (I) (cf. this vol., 174). Neither (I) nor  $\text{COMe}_2$  is produced. F. O. H.

**Acetopyruvic acid ( $\alpha\gamma$ -diketovaleric acid) as an intermediate metabolite in animal tissues.** H. A. KREBS and W. A. JOHNSON (Biochem. J., 1937, 31, 772—779).— $\alpha\gamma$ -Diketo-*n*-valeric acid (I) is metabolised by liver, muscle, kidney, testes, and S (A., III.)

brain (rat, pigeon),  $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$  being formed under aerobic, and  $\beta$ -hydroxybutyric acid under anaerobic, conditions. Ketones are formed more rapidly from (I) than from  $\text{AcOH}$  or  $\text{AcCO}_2\text{H}$ , indicating that (I) may be an intermediary in the synthesis of ketones from these acids. P. W. C.

**Physiological and biochemical significance of oxidation of ethyl alcohol in the organism.** E. LE BRETON (Bull. Soc. Chim. biol., 1937, 19, 17—43).—A lecture.

**Diffusion of ethyl alcohol in marine animals, and the bound-water hypothesis.** M. NICLOUX (Compt. rend., 1937, 204, 832—834).—The val. of the coeff. *K* (see A., 1934, 1021) is low, averaging 1.15, for the ten different species of marine animals examined, but rising to ~1.5 when these animals are placed in fresh  $\text{H}_2\text{O}$ . This is parallel to the decrease in val. from 1.5 to 1.1 when fresh- $\text{H}_2\text{O}$  creatures are placed in sea- $\text{H}_2\text{O}$ . F. A. A.

**Path of urea in the kidney of *Salamandra maculosa*.** Laur. J. GICKLHORN (Protoplasma, 1936, 26, 70—89).—Using the xanthhydrol reaction to demonstrate the presence of urea (I), it is shown that (I) passes from the glomerular capillaries into the Bowman's capsules without change in concn. and that the urine is then conc. by re-absorption of  $\text{H}_2\text{O}$  as it passes down the tubuli contorti. There is no evidence that (I) is secreted by the epithelial cells of the tubuli contorti. M. A. B.

**Influence of dietary inorganic salts on the ash of rat's tissues.** E. S. EPPRIGHT and A. H. SMITH (J. Biol. Chem., 1937, 118, 679—692).—The influence of inorg. components on the ash of various tissues is examined and discussed. Muscle-K:Na ratio is dependent on dietary Ca, whilst Cl is more directly related to dietary Cl. R. M. M. O.

**Utilisation of energy-producing nutriment and protein as affected by sodium deficiency.** O. J. KAHLENBERG, A. BLACK, and E. B. FORBES (J. Nutrition, 1937, 13, 97—108).—Insufficiency of dietary Na adversely affected appetite, live-wt. increase, energy storage, and synthesis of fat and protein in rats. The digestibility of protein and the metabolisability of energy foods were unaffected but heat loss was increased. Na-containing diets increased Na retention and improved growth.

A. G. P.

**Exchanges between blood-plasma and tissue-fluid in man.** A. KEYS (Science, 1937, 85, 317—318).—After violent exercise, [Na] in the plasma is 2—10% > the resting level but returns to normal in 15 min., at which time the return of  $\text{H}_2\text{O}$  is >75% complete. The rate of exchange of Na across the capillary wall is apparently much < that of  $\text{H}_2\text{O}$ , but is still rapid in comparison with the readjustment of the blood vol. The behaviour of the plasma-K is much more complex. The exchanges of  $\text{Na}^+$ ,  $\text{Ca}^{++}$ ,  $\text{H}_2\text{O}$ , protein, and possibly  $\text{SO}_4'''$  and  $\text{Cl}^-$  can readily be interpreted in terms of osmosis and different rates of diffusion through the capillary walls, but such explanations are inadequate for the  $\text{K}^+$  exchanges.

**Potential alkalinity of honey: its acid-base value as a food.** R. E. LOTHROP (J. Nutrition, 1936, 11, 511—514).—Eleven samples of honey examined by the Davidson-Le Clerc method (A., 1935, 554) showed an average alkaline val. of 1.5. A. G. P.

**Utilisation by the organism of various calcium salts administered by mouth.** F. SCHMITT and W. BASSE (Arch. exp. Path. Pharm., 1937, 184, 538—540).—A table summarises the amounts of Ca given by mouth as the phosphate, acetate (I), or gluconate (II) and the amounts excreted in urine and faeces. The amount utilised when given as (II) and (I) was 66% and 31.5—59.5%, respectively, of the intake. (II) given intravenously is but little utilised.

**Use of three-day periods in human metabolism studies. Calcium and phosphorus.** S. I. PYLE and C. E. HUFF [with R. DAVIS] (J. Nutrition, 1936, 11, 495—509).—A 3-day balance period with a 24-hr. sampling on the third day is used for determining the utilisation of Ca and P during pregnancy. A. G. P.

**Relation between calcium retention and the store of calcium in the body, with particular reference to the determination of calcium requirements.** B. W. FAIRBANKS and H. H. MITCHELL (J. Nutrition, 1936, 11, 551—572).—The Ca content of growing rats is dependent on that of the diet (if < the requirement for max. storage) and is inversely related to the rate of growth. Low levels of dietary Ca may retard growth during the consumption of the deficient diet and subsequently during adequate Ca nutrition. There is no Ca requirement for maintenance of the growing animal. Differences in the degree of Ca saturation of skeletal tissues in rats caused by previous feeding of different levels of Ca produce irregularities in Ca retention when dietary Ca is maintained at a uniform level. Previous low saturation with Ca is associated with subsequent high retention, on adequate diets. The bearing of these results on nutritional experiments is discussed.

A. G. P.  
**Magnesium requirements of pre-school children.** A. L. DANIELS and G. J. EVERSON [with M. F. DEARDORFF, E. M. KNOTT, F. I. SCOLAR, and O. E. WRIGHT] (J. Nutrition, 1936, 11, 327—341).—Diets of children of 4—7 years should contain < 13 mg. of Mg per kg. body-wt. Retention of Mg was unrelated to the amount of Ca ingested or retained. Variations in ingested Mg were paralleled by those in urinary Mg. In 75% of cases examined ingestion of generous amounts of Mg was followed by high retention and high elimination of Mg in urine. A. G. P.

**Retention and utilisation of orally administered iron.** W. M. FOWLER and A. P. BARER (Arch. Int. Med., 1937, 59, 561—571).—When Fe is given in large doses in treatment of hypochromic anaemia about 30% is retained in the body, but only about 2% is utilised to form haemoglobin. R. M. M. O.

**Iron metabolism of normal young women during consecutive menstrual cycles.** R. M. LEVERTON and L. J. ROBERTS (J. Nutrition, 1937, 13, 65—95).—Fe balances are recorded for periods

covering 4—5 menstrual cycles. The optimum Fe requirement is 16—17 mg. daily for a 56-kg. woman. Low haemoglobin vals., often accepted as normal in women, result from insufficient dietary Fe rather than from menstrual losses. A. G. P.

**Active absorption of anions in the animal kingdom.** A. KROGH (Nature, 1937, 139, 755).—It is suggested that a mechanism closely resembling that demonstrated by Lundegardh for plants is of widespread occurrence and of considerable biological significance in animals. L. S. T.

**Excretion of bromide, iodide, and thiocyanate by the perfused frog kidney.** E. P. LAUG and R. HOBER (J. Cell. Comp. Physiol., 1936, 8, 347—356).—The frog kidney perfused with Ringer solution concentrates CNS' by secretory activity of the tubules, dilutes Br' by reabsorptive activity of the tubules, but reacts indifferently towards I'.

M. A. B.  
**Metabolism of ammonia in sea urchin's eggs.** Å. ØRSTROM (Naturwiss., 1937, 25, 300—301).—From observations on the NH<sub>3</sub> metabolism of fertilised and unfertilised sea urchin's eggs it is concluded that NH<sub>3</sub> derived from the oxidation of NH<sub>2</sub>-acids is fixed by some substance of unknown nature. In unfertilised eggs fixation of NH<sub>3</sub> is slow, while its formation is relatively rapid. After fertilisation an NH<sub>3</sub>-fixing substance (I) is formed and the NH<sub>3</sub> formed by oxidation is removed. Addition of NH<sub>4</sub> salts promotes fixation of NH<sub>3</sub>. As the fixation of NH<sub>3</sub> is dependent on the respiration, it is inhibited under anaerobic conditions. (I) in fertilised eggs can be replaced in unfertilised eggs by certain NH<sub>2</sub>-acids and this leads to nuclear growth and division. The appearance of (I) is probably coupled with chromosome formation. E. A. H. R.

**Rate of "organification" of phosphorus in animal tissues.** C. ARTOM, G. SARZANA, C. PERRIER, M. SANTANGELO, and E. SEGRÉ (Nature, 1937, 139, 836—837).—Using <sup>32</sup>P as indicator, the relative amounts of inorg. P (Na phosphate) taken up by different organs when injected into young rats have been determined. Subsequent analysis shows the presence of radioactive lipin-P in liver, intestine, and kidney in amounts in muscle or brain. This indicates that the participation of the phospholipins results, at least in part, in a complete synthesis starting from inorg. P. L. S. T.

**Action of radium rays on the growth of cells in vitro.** L. HALBERSTADTER and L. DOLJANSKI (Nature, 1937, 139, 841—842).—By irradiating chick's mesenchyme cells *in vitro* and held at 6° so that active cell life is inhibited, and then allowing the cultures to develop, the amount of growth inhibition and the dose of rays applied have been correlated.

L. S. T.  
**Geiger-Müller counter for detecting small amounts of radium stored in radium workers.** E. O. BRAATEN and J. D. LEITCH (J. Ind. Hyg., 1937, 19, 193—197).—A portable instrument is described and data for 9 individuals are recorded.

J. G. A. G.  
**Production of sympathin in response to physiological stimuli in the unanæsthetised**

animal. P. P. PARTINGTON (Amer. J. Physiol., 1936, 117, 55—58). R. N. C.

**Models for the stimulation of the organ of smell.** H. G. B. DE JONG and G. G. P. SAUBERT (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 302—306).—Tentative models (coacervate systems) are suggested representing the mechanism of the stimulation of smell, assuming that the mols. of the odorous substance penetrate into a certain substratum of cells of the nose and cause a reversible change in condition. J. W. S.

**Osmotic pressure of organs. II. Osmotic pressure of the kidney, blood, and urine following intravenous injection of water or hyper- and hypo-tonic solutions of pharmaceutical substances.** I. SIMON (Arch. Farm. sperim., 1937, 63, 1—46).—The osmotic pressure of the blood (rabbit) increases with hyper- and remains unchanged with iso- and hypo-tonic solutions; that of the kidney and, to a greater extent, that of the urine always (with few exceptions) diminish. The mechanism of these changes is discussed. F. O. H.

**Physico-chemical conditions of the bursting and dehiscence of the spermatophores of some cephalopods.** M. ROSE and M. HAMON (Compt. rend., 1937, 204, 898—900).—In cephalopods, the "Needham pocket," in which the spermatophores are held after formation, is distinctly acid, the varying from 5.8 at the bottom to 6.2 at the top. The effects of placing the spermatophores in sea- $H_2O$ , fresh  $H_2O$ , isotonic glucose solution, and various salt solutions are described; these effects are complex, and vary with the species, and with the original situation of the spermatophores in the pocket. F. A. A.

**Growth of tissue cultures in heavy water.** A. FISCHER (Protoplasma, 1936, 26, 51—55).— $D_2O$  in concn. <20—25% has no adverse effect on fowl heart fibroblasts. Above 20—25% the adverse effect increases linearly up to 100%, when growth is entirely suppressed. The adverse effect is reversible. Growth of mouse carcinoma is completely suppressed in 50%  $D_2O$ . Rous fowl sarcoma showed depression of both cell growth and proteolytic decomp. of the plasma clot in 70%  $D_2O$ . M. A. B.

**Comparison of the inhibitory action of cations on dispersion of the cell aggregates in the sponge, *Haliciona*.** W. E. BRADWAY (Protoplasma, 1936, 25, 546—549).—With isotonic urea at 8 as dispersing agent the different cations showed the following relative inhibiting powers:  $K^+$  1.00,  $Cs^+$  1.02,  $NH_4^+$  1.03,  $Li^+$  1.25,  $Rb^+$  1.25,  $Na^+$  1.60,  $Sr^{++}$  9.75,  $Ba^{++}$  17.78,  $Ca^{++}$  23.46,  $Mg^{++}$  49.70. M. A. B.

**Action on metabolism of Karlsbad mineral waters.** A. KERN and E. STRANSKY (Arch. exp. Path. Pharm., 1937, 184, 170—180).—Administration of Karlsbad spring water to young and to adult rabbits and guinea-pigs for 4 weeks increased the liver-glycogen in 50% and activated liver amylase in over 30% of the animals. The effect is not obtained with rats. The liver contents of fat, reduced glutathione, lipase, and phosphatase were unaffected. P. W. C.

**Absorption of sodium chloride from the small intestine at various degrees of anoxæmia.** E. J. VAN LIERE and C. K. SLEETH (Amer. J. Physiol., 1936, 117, 309—312).—Absorption of 0.9% NaCl in dogs and cats is decreased by low  $O_2$  tensions; Fluid absorption and NaCl absorption run parallel. There is an apparent min. absorption at 8.35—10.56%  $O_2$ . R. N. C.

**Effects of sodium fluoride administration on the basal metabolic rate of experimental animals.** P. H. PHILLIPS (Amer. J. Physiol., 1936, 117, 155—159).—NaF does not affect the metabolic rate in normal animals, but increases it in scurvy or during sensitisation by desiccated thyroid (I). The falls in body-wt. produced by NaF and (I) in rats are parallel. R. N. C.

**Action of calcium on the isolated frog's heart.** G. ORZECOWSKI (Arch. exp. Path. Pharm., 1937, 184, 694—701).—Diagrams show the increased excursion of hypodynamic frog's heart on addition to the suspension fluid of  $Na_2CO_3$ , kaolin,  $BaSO_4$ ,  $CaCO_3$ , or  $Na_2C_2O_4$ . The mechanism of the effect is discussed. P. W. C.

**Effect of various calcium preparations on the amount of lead in blood and urine and its relationship to phosphate metabolism in normal [men].** F. SCHMITT and W. BASSE (Arch. exp. Path. Pharm., 1937, 184, 541—546).—Tables summarise the human plasma- and erythrocyte-Ca,  $-PO_4'''$ , and  $-Pb$  on diets deficient in Ca and with added Ca (as phosphate, gluconate, and lactate) and the urinary excretion of Pb under these conditions. A diet deficient in Ca leads to mobilisation of Pb in blood. Intravenous injection of Ca similarly leads to mobilisation of Pb and increase of both Ca and  $PO_4'''$  contents of the plasma and erythrocytes. Oral administration of Ca leads to increased Ca in plasma and erythrocytes, increase of total  $PO_4'''$  in both, and greatly increased blood- and urine-Pb. P. W. C.

**Magnesium and chloride "permeation" in muscle.** E. J. CONWAY and G. CRUESS-CALLAGHAN (Biochem. J., 1937, 31, 828—836; cf. A., 1934, 1398).—The Mg content of frog's sartorius muscle is  $26.8 \pm 0.6$  mg. per 100 g., which falls to  $22.3 \pm 1.0$  mg. after 1—5 days' immersion in Ringer's solution. During this long period of retention of the bound Mg,  $Mg^{++}$  enters freely. For short-period immersions  $Mg^{++}$  enters the muscle much more slowly than  $Cl^-$ . When vol. changes occur in the immersed muscle, the "permeation" val. of  $Cl^-$  alters in inverse proportion to the change in tissue  $H_2O$ .  $Cl^-$  "permeation" is unaffected by Mg. The distribution of Mg in the tissues, plasma, and urine of the frog is examined. E. A. H. R.

**Results of feeding various levels of soil containing beryllium to chickens, dogs, and rats.** C. W. DUNCAN and E. J. MILLER (J. Nutrition, 1936, 11, 371—382).—Ingestion of considerable amounts of soil containing 0.223% of Be caused no rachitic symptoms, no disturbance of growth, and no diminution in plasma-inorg. P in rats, chicken, or dogs. A. G. P.

**Pharmacological action of salts of pure zirconium and pure hafnium.** J. VAN NIEKERK (Arch. exp. Path. Pharm., 1937, 184, 686—693).—The action of  $ZrOCl_2$  and  $HfOCl_2$  on smooth muscle of intestine and uterus, surviving heart, and blood vessels is investigated. The two salts have almost identical action. P. W. C.

**Action of colloidal cupric oxide on hæmatopoietic tissue and the accumulation of electropositive colloids in the reticulo-endothelial elements.** E. MENEGHETTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 63—65).—The phenomenon of hæmatopoietic action previously noted (together with detection of microscopically visible granules in the reticulo-endothelial elements of hæmatopoietic tissue) with injected electronegative colloids also occurs with electropositive colloids (CuO) but the colloidal particles are protected from flocculation and granules are not observed. F. O. H.

**Influence of phosphorus on fibroblast culture.** K. SAITO (Folia Pharmacol. Japon., 1935, 21, 187—191).—Small doses of P in gum acacia solution increased, and larger doses decreased, the growth of fibroblast. CH. ABS. (p)

**Obtaining aberrative forms of butterflies by chemical treatment.** J. ZACWILICHOWSKI (Bull. Acad. Polonaise, 1936, B, 481—497).—Colour aberration in butterflies was produced by injection of phospho-tungstic and -molybdic acids into the pupæ. A. G. P.

**Influence of boric acid and borax on growth of fibroblast and epithelial cultures: morphological changes following administration of these drugs.** M. MAEDA (Folia Pharmacol. Japon., 1935, 21, 213—222).—Small concns. of both substances increase and larger concns. inhibit growth. CH. ABS. (p)

**Changes in blood or serum viscosity of the rabbit under influence of alcohol.** H. WAKAI (Folia Pharmacol. Japon., 1935, 21, 207—212).—Oral administration of dil. EtOH causes diuresis and a decrease of  $\eta$  in serum and blood without change in sp.  $\eta$ . Larger dosages sufficient to cause a deep narcosis decreased serum-protein, increased the albumin/globulin ratio and (slightly) blood- $\eta$  and the sp.  $\eta$  of serum. CH. ABS. (p)

**Action of " $\beta\gamma$ -hexenol," a constituent of the raw leaves of *Thea sinensis japonica*: comparison of this substance with hexyl alcohol.** II. Action on the vessels, skeletal muscles, and motor nerve endings. S. MURAKAMI (Folia Pharmacol. Japon., 1935, 21, 165—174; cf. this vol., 215).—Physiological effects are described. CH. ABS. (p)

**Pharmacological action of certain derivatives of pyrrole, pyridine, and pyrazole.** R. S. A. HEATHCOTE (Quart. J. Pharm., 1937, 10, 59—66).—Six derivatives were investigated. Comparison with published data indicates that corresponding derivatives of pyrazole and pyrrole are qualitatively similar in their action. R. M. M. O.

**Toxicity of various phenols to fresh-water fish.** E. HURAUULT (Compt. rend. Acad. Agric.

France, 1936, 22, 324—327).—PhOH is more toxic to *Goudonius rutilus* and *Scardinius erythrophthalmus*, Linn., than *o*-cresol; *m*-5- and *p*-xylenol are still less toxic. A. W. M.

**Failure of aspirin to affect urinary excretion of ascorbic acid.** J. B. YOUMANS, M. B. CORLETTE, H. FRANK, and M. CORLETTE (Proc. Soc. Exp. Biol. Med., 1937, 36, 73—76).—Ingestion of as much as 2.6 g. of aspirin has no effect on urinary excretion of ascorbic acid. P. G. M.

**Pressor action of a group of amines related to  $\omega$ -aminoacetophenone.** M. R. GURD (Quart. J. Pharm., 1937, 10, 1—22).—Twelve derivatives of  $NH_2 \cdot CH_2 \cdot Bz$  and  $NH_2 \cdot CHMe \cdot Bz$  were all found to have sympathomimetic properties, but of strength considerably < that of adrenaline. Attempts to grade them quantitatively by their pressor action did not give consistent results. R. M. M. O.

**Acidosis associated with administration of *p*-aminobenzenesulphonamide "prontylin."** H. SOUTHWORTH (Proc. Soc. Exp. Biol. Med., 1937, 36, 58—61).—Two cases of acidosis are reported with large doses of prontylin; all cases showed a fall in  $CO_2$ -combining power of the plasma. P. G. M.

**Twitch tension and initial heat in caffeinised frog muscle.** G. SASLOW (J. Cell. Comp. Physiol., 1936, 8, 387—401).—Treatment of frog sartorii with 0.02—0.045% caffeine-Ringer solution increased twitch tension and initial heat production and also resting heat rate both in  $O_2$  and  $N_2$ . M. A. B.

(A) Change in blood- and serum-viscosity of rabbits in hydræmia or under the influence of diuretics with special reference to the relation between specific viscosity and diuresis. (B) Change through intravenous infusion of Ringer-Locke or glucose solutions. (C) Changes brought about by diuretics. H. WAKAI (Folia Pharmacol. Japon., 1935, 21, 114—121, 141—150, 151—160).—(A) The sp.  $\eta$  can be calc. from  $\eta$  and the protein concn. of the blood.

(B) When hydræmia was induced by the infusion, equilibrium was established between the fluid injected and the urine excreted. Change in sp.  $\eta$  was small when Ringer-Locke solution was used but vals. declined when aq. glucose was injected. In the latter case the albumin/globulin quotient also decreased.

(C) Caffeine, theocaine, and theobromine did not affect blood- $\eta$  but decreased the sp.  $\eta$ . Hg preps. and KOAc decreased blood-protein and - $\eta$  without affecting sp.  $\eta$ . CH. ABS. (p)

**Sheep blow-fly. III. Chemotropism of *Lucilia sericata*, Mg.** IV. Chemistry of the fleece with reference to the susceptibility of sheep to blow-fly attack. R. P. HOBSON (Ann. Appl. Biol., 1936, 23, 845—851, 852—861).—III. Attraction of *L. sericata* to putrefying substances is largely attributable to the presence of indole, skatole, and  $(NH_4)_2CO_3$ . Dil. aq. solutions of these substances induce oviposition.

IV. The proportion of suint in the fleece is not necessarily related to susceptibility to blow-fly strike. The  $p_H$  of  $H_2O$  extracts of the fleece is paralleled by the suint content of the wool. A. G. P.

**Glucose utilisation of phloridzinised dogs after hepatectomy.** D. R. DRURY, H. C. BERGMAN, and P. O. GREELEY (Amer. J. Physiol., 1936, 117, 323—327).—Completely phloridzinised dogs require about 75 mg. of glucose (I) per kg. per hr. to maintain blood-(I) at the pre-operative level. Lactic acid and muscle-glycogen do not account for the extra (I). The (I):N ratio is about 6 if (I) utilisation and excretion are added together. R. N. C.

**Action of catalysin (thionine) in methæmoglobin[forming] poisoning.** F. HAUSCHILD (Arch. exp. Path. Pharm., 1937, 184, 458—467).—When toxic but not lethal doses of methæmoglobin (I)-forming poisons ( $\text{NaNO}_2$ ,  $\text{NH}_2\text{Ph}$ ,  $\text{NHPh}\cdot\text{OH}$ ) were administered to cats and rabbits such that the (I) content rose to 40—50%, injection of thionine led to almost complete reconversion of (I) into hæmoglobin. The mechanism is discussed (cf. A., 1936, 1293).

P. W. C.

**Diffusion coefficients of inulin and other substances of interest in renal physiology.**—See A., I, 361.

**Relation of lipins to physiological activity.** H. H. WILLIAMS and W. E. ANDERSON (Oil and Soap, 1937, 14, 122—124).—The phospholipin and free cholesterol contents of tissue vary directly with its physiological activity. Such activity, however, tends to decrease the content of cholesteryl esters and neutral fat. T. G. G.

**Liver-lecithin and -glycogen in normal and thyroidectomised animals.** II. F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1936, 11, 966—967; cf. this vol., 178).—Injection of aq. emulsion of lecithin into rabbits, guinea-pigs, and dogs reduces the liver-glycogen. This effect does not occur in thyroidectomised animals or when aq. glucose is simultaneously injected. F. O. H.

**Lecithin and blood-sugar in normal and thyroidectomised animals.** III. Injection of insulin. IV. Injection of glucose and adrenaline. F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1936, 11, 968—969, 970—971; cf. preceding abstract).—Injection of an aq. emulsion of lecithin increases liver-glycogenolysis and hence renders the normal (but not thyroidectomised) animal less sensitive to the hypoglycæmic action of insulin or to the hyperglycæmic action of glucose or adrenaline. F. O. H.

**Action of choline on the fatty liver due to phloridzin.** F. CEDRANGOLO and R. CONTE-MAROTTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 12—14).—With rats subcutaneously injected with phloridzin, the liver-glycogen is increased and, to a smaller extent, liver-fat is diminished by oral administration of choline (cf. this vol., 18). F. O. H.

**Effect of sympathomimetic and parasympathomimetic substances on the chemical processes producing the energy of muscular contraction.** II. Effect of acetylcholine. A. MARNAY and D. NACHMANSOHN. III. Effect of adrenaline on minced muscle. D. NACHMANSOHN (Bull. Soc. Chim. biol., 1937, 19, 446—452, 453—459; cf. A., 1936, 1295).—II. Acetylcholine (I), like adren-

aline (II), accelerates anaerobic glycolysis in muscle, but whilst (II) causes a resynthesis of phosphagen (III), (I), like other parasympathomimetic substances such as  $\text{K}^+$  and pilocarpine, accelerates the decomp. of (III). The (I) concn. required to produce this effect is about 1/60 of that of  $\text{K}^+$ .

III. (II), in concns. of 5—10  $\times 10^{-4}\%$ , accelerates glycolysis in minced frog's muscle. Phosphorylation is promoted (even when glycolysis is inhibited by  $\text{F}'$ ) and the hexose monophosphate content increases.

E. A. H. R.

**Pharmacological studies of the automatic movement of the rabbit testicle.** II. Influence of the thyroid and pancreas on the sensitivity of the testicle towards acetylcholine and adrenaline. R. UCHIHASHI (Folia Pharmacol. Japon., 1935, 21, 175—186).—One day after thyroidectomy the sensitivity of the musculature of the rabbit testicle to adrenaline (I) and acetylcholine (II) is increased; subsequently it returns to normal. Repeated injection of thyroxine increases the sensitivity to (II) and diminishes that to (I). Repeated injection of insulin increases sensitivity to (II) whereas that to (I) is unchanged or weakened. Thyroid and pancreas may be concerned in the maintenance of the tonus of the motor nerves of the testicle. CH. ABS. (*p*)

**Effect of acetylcholine and other constituents of the adrenal gland on blood-sugar and -amino-acids.** B. L. DAVIS, jun., and J. M. LUCK (Amer. J. Physiol., 1936, 117, 542—552).—Acetylcholine (I) causes hyperglycæmia in rabbits if convulsions occur, but moderate hypoglycæmia in their absence. After adreno-medullectomy (I) always causes hyperglycæmia, which is therefore not due to adrenaline (II) discharge. Blood- $\text{NH}_2$ -acids (III) are increased both in normal and adreno-medullectomised animals, whether or not convulsions appear. Cortin and ascorbic acid do not affect blood-sugar or (III). The min. dose of (II) required for hyperglycæmia is slightly < that required to depress (III). R. N. C.

**Response of the spleen to the intravenous injection of certain secretin preparations, acetylcholine, and histamine.** J. FERGUSON, A. C. IVY, and H. GREENGARD (Amer. J. Physiol., 1936, 117, 701—707). R. N. C.

**Inhibition by alcohols of the effect of acetylcholine and histamine on the isolated intestine of the guinea-pig.** M. GUILLOT and O. S. GWAN (Compt. rend. Soc. Biol., 1937, 125, 33—35).—The sensitivity of the muscle is decreased by various aliphatic alcohols. H. G. R.

**Effect of anti-esterases on the pharmacodynamic action of acetylcholine.** E. KAHANE and J. LÉVY (Compt. rend. Soc. Biol., 1937, 125, 252—256).—The sensitising action on muscle of geneserine (I), ephedrine, antipyrine, and choline (II) is < that of eserine, whilst only (I) and (II) have a similar effect on the hypotensive action of acetylcholine on the dog. H. G. R.

**Effect of amino-acids on the action of histamine on the intestine.** S. EDLBACHER, P. JUCKER, and H. BAUR (Z. physiol. Chem., 1937, 247, 63—64; cf. Bloch and Pinosch, A., 1936, 885).—The action

of histamine on the isolated intestine is strongly inhibited by arginine (I), histidine, and cysteine but not by other  $\text{NH}_2$ -acids. (I) does not inhibit the action of acetylcholine. W. McC.

**Effect of cysteine on hereditary hypotrichosis in the rat (*Mus norvegicus*).** E. ROBERTS (J. Biol. Chem., 1937, 118, 627—630).—There was no evidence that cysteine affects hereditary hypotrichosis in rats (cf. Martin and Gardner, A., 1935, 1402). P. G. M.

**Liver and creatinuria.** I. I. NITZESCU and I. GONTZEA (Compt. rend. Soc. Biol., 1937, 125, 77—80).—Excretion of creatine (I) is decreased in dogs on a meat-free diet and increased on intravenous injection of (I). P poisoning decreases the (I) tolerance.

H. G. R.

**Effectiveness of orally administered diastase in achylia pancreatica in dogs.** J. M. BEAZELL, C. R. SCHMIDT, and A. C. IVY (J. Nutrition, 1937, 13, 29—37).—Abs. achylia produced by separating the pancreas from the duodenum caused a marked increase in faecal starch. Administration of diastatic enzymes lowered the starch loss, vegetable diastases being more effective than pancreatic amylase (I). Enteric coating of (I) rendered it as effective as plant diastase.

A. G. P.

**Effect of enteric-coated pancreatin on fat and protein digestion of depancreatized dogs.** W. A. SELLE [with I. W. MOODY] (J. Nutrition, 1937, 13, 15—28).—Administration of pancreatin preps. to depancreatized dogs sustained with insulin reduced the faecal loss of N, increased the elimination time to normal, but had no effect on the loss of fat. The coating (a resinous, substance sol. in alkali at  $p_{\text{H}}$  4, designed to protect pancreatin against inactivation by gastric juice) did not affect the digestion of fat or protein.

A. G. P.

**Relation of pancreatic juice to pancreatic diabetes.** H. P. HARMS, J. VAN PROHASKA, and L. R. DRAGSTEDT (Amer. J. Physiol., 1936, 117, 160—165).—Complete withdrawal of pancreatic juice for 4—6 weeks in dogs does not induce hyperglycaemia or glycosuria. Oral administration of pancreatic juice to depancreatized dogs does not affect the diabetes, but on a standard diet and insulin intake it usually increases the glucose excretion. R. N. C.

**Toxic action of hæmolysed erythrocytes.** L. WALTERSKIRCHEN and S. ZACHERL (Arch. exp. Path. Pharm., 1937, 184, 659—666).—When guinea-pig erythrocytes are hæmolysed by rabbit serum *in vitro*, a substance is formed which, when injected intravenously into cats, causes considerable lowering of blood pressure. When the cells are hæmolysed with  $\text{H}_2\text{O}$ , no such substance is formed. Pretreatment of the animal with physostigmine increases, and with atropine decreases, the effect.

P. W. C.

**Liberation of a sympathicomimetic substance by section of the vagus nerves in the neck of the decapsulated dog.** F. JOURDAN and G. MORIN (Compt. rend. Soc. Biol., 1937, 125, 285—287).

H. G. R.

**Colloidal metal absorption by tissue cells. I. Influence of serum, serum-albumin, and serum-globulin on metal absorption by surviving**

**rabbit liver. II. Influence of various lyophile colloids on metal absorption of tissue cells in surviving rabbit liver. III. Influence of lyophile colloids on metal absorption of tissue cells of surviving spleen and kidney.** K. S. LEE (Folia Pharmacol. Japon., 1935, 21, 1—9).—I. In presence of rabbit serum, serum-albumin and -globulin the amount of Ag remaining in liver-tissues after perfusion with collargol 0.02% in aq. NaCl 0.85% was approx. half that remaining when these colloids were absent.

II. Presence of peptone, ovalbumin, egg white protein (I), gelatin (II), or gum arabic increases the Ag remaining in liver after perfusion with collargol. Starch had little effect.

III. Lyophilic colloid [serum, (I), or (II)] decreased the amount of Ag absorbed. Serum was the most effective.

CH. ABS. (p)

**Increased water exchange following Eck fistula in dogs.** L. A. CRANDALL, jun., and G. M. ROBERTS (Amer. J. Physiol., 1936, 117, 318—322).—Eck fistulae and  $\text{CHCl}_3$  poisoning lead to increased voluntary  $\text{H}_2\text{O}$  intake and excretion. The increased  $\text{H}_2\text{O}$  exchange is correlated with a greater dilution of plasma-Cl' after oral administration of  $\text{H}_2\text{O}$ .

R. N. C.

**Divinyl ether as a general anæsthetic.** I. S. RAYDIN, E. L. ELIASON, G. M. COATES, T. B. HOLLOWAY, L. K. FERGUSON, A. B. GILL, and T. J. COOK (J. Amer. Med. Assoc., 1937, 108, 1163—1167).—Divinyl ether may be used for anæsthesia of short duration, simultaneous administration of  $\text{O}_2$  being required for periods >45 min. The toxicity is > that of  $\text{Et}_2\text{O}$  but < that of  $\text{CHCl}_3$ .

H. G. R.

**Antagonism of narcotics and the analeptics coramine and picrotoxin.** H. T. A. HAAS (Arch. exp. Path. Pharm., 1937, 184, 468—475).—In determinations of the min. dose of narcotic which inhibits the action in rats of doses 40% > the lethal dose of coramine (I), picrotoxin (II) and cardiazole (III), it is shown that antagonistic action to a particular analeptic only occurs with certain narcotics; e.g., chloral hydrate protects against (I) and (II), avertin against (I), urethane against (III) and (II).

P. W. C.

**Influence of analeptics on avertin narcosis.** K. ZIPF and H. MERTINS (Arch. exp. Path. Pharm., 1937, 184, 702—709).—Intraperitoneal injection of avertin (0.4 g. per kg.) into the rat causes a deep narcosis which is best antagonised by cardiazole-ephedrine, cardiazole, and ikorol. Hexetone and strychnine have only a slight antagonistic action. Coramine prolongs and intensifies narcosis.

P. W. C.

**[Pharmacology of] 2-methylallyl derivatives of barbituric acid.** E. E. SWANSON and W. E. FRY (J. Amer. Pharm. Assoc., 1937, 26, 317—319).—Comparison of 22 methylallyl derivatives with the parent barbituric acids indicates that the former have a shorter duration of action.

F. O. H.

**Distribution of veronal over the organs in a fatal case of veronal poisoning.** J. F. RETTÉN (Pharm. Weekblad, 1937, 74, 649—652).—The veronal contents of the small and large intestines, duodenum, stomach, urine, gall-bladder, muscle, liver, spleen,

kidney, and blood were determined. The body contained 6.29 g. of unabsorbed and 4.27 g. of reabsorbed veronal. S. C.

**Comparison of atropine and syntropan.** K. FROMHERZ (J. Pharm. Exp. Ther., 1937, 60, 1—13).—The toxicity of syntropan (I) with rodents is  $>$ , and with cats is  $<$ , that of atropine (II). With cats the mydriatic action of (I) is 1000 times  $<$  and the parasympathetic depressant action is 500 times  $<$  that of (II). With rabbits, the action of (I) on salivary secretion in urethane narcosis excited by pilocarpine is 100 times  $<$  and the spasmolytic action exerted through the nerve endings of the isolated intestine is 20 times  $<$  that of (II). P. W. C.

**Antagonism between adrenaline and some isoquinoline derivatives: cotarnine and anhydrocotarnine-N-methyloxindole.** F. P. LUDUENA (Quart. J. Pharm., 1937, 10, 67—80).—Both drugs in suitable quantities transitorily inhibit the pressor action of adrenaline by direct action on peripheral nerve endings but do not reverse this action. They are, however, both hypotensive and so their own action may be masking any such reversal. Their direct action on the uterus, which depends on the dose, is also examined. R. M. M. O.

**Influence of the thymus hormone on the poisonous action of opium alkaloids.** K. ARIMA (Folia Pharmacol. Japon., 1935, 21, 41—47).—In young suckling rabbits thymusectomy diminished and injection of thymus extract greatly increased the sensitivity to morphine, heroin, and codeine.

CH. ABS. (p)

**Relief of spasm by opium alkaloids.** K. PLUM (Arch. exp. Path. Pharm., 1937, 184, 126—132).—Using leech muscle free from nerve centres, the ability to relieve nicotine spasm of the following alkaloids is given by the ratios thebaine: codeine: morphine: papaverine: narcotine: narceine = 80:10:9:7:2:1. P. W. C.

**Mutual action of cocaine and opium alkaloids.** F. EICHHOLTZ and W. KRAUTH (Arch. exp. Path. Pharm., 1937, 184, 667—673).—Morphine and other opium alkaloids increase cocaine spasm. P. W. C.

**Increase of the blood-pressure action of adrenaline substances by sparteine.** W. GRAUBNER and H. KRAUS (Arch. exp. Path. Pharm., 1937, 184, 235—240).—Pretreatment of cats and dogs with sparteine increases and prolongs the action of adrenaline, sympatol, and metasymptol on blood pressure. After removal of the adrenals the action is completely inhibited. P. W. C.

**Determination of small amounts of strychnine with *Carassius vulgaris*.** K. PLUM (Arch. exp. Path. Pharm., 1937, 184, 133—138).—A method is described for the detection of 0.0001 mg. of strychnine in terms of its effect on small (4-cm.) carp (*C. vulgaris*). P. W. C.

**Strychnine and chronaxie.** P. K. KNOEFEL (Amer. J. Physiol., 1936, 117, 638—641).

R. N. C.

**Alkaloids of ergot.** G. BARGER (Analyst, 1937, 62, 340—354).—The nature and structure of these alkaloids and the toxicology of convulsive and

gangrenous ergotism are discussed. Methods of chemical, colorimetric, and spectroscopic assay, and the separate assay of ergometrine, are described.

J. G.

**Absorption of ouabain (Gratus-strophanthin) by the liver in heart-lung-liver preparations.** M. KIESE, H. GUMMEL, and R. S. GARAN (Arch. exp. Path. Pharm., 1937, 184, 197—213).—Using a dog's heart-lung-liver prep., the amount of ouabain fixed by the liver is  $1.53 \times 10^{-6}$  g. per g. of liver and using a heart-lung prep. the lethal dose is  $2.24 \times 10^{-6}$  g. per g. of heart. P. W. C.

**Evaluation of digitalis preparations by oral administration.** L. W. VAN ESVELD (Arch. exp. Path. Pharm., 1937, 184, 450—457).—A method is described for determination of the lethal dose of digitalis preps. on oral administration to decerebrate cats and the results are compared with those by intravenous injection. Expressed as a % of the dose by injection, the oral doses are for folinerin 40—50%, digitoxin and verodigen 50—60%, digisol, digitalysatum, digalen, lanadigin, and digilamid 75—125%, digitoxigenin 600%, and gitoxigenin 1000%. P. W. C.

**Difference in action of *Digitalis purpurea* and *D. lanata*.** (Investigation with cold-blooded animals.) F. HEIM (Arch. exp. Path. Pharm., 1937, 184, 214—228).—Using perfused frog's hearts, the latent period with *D. purpurea* (I) is 3—4 times as large as with *D. lanata* (II), the max. performance of work is reached more quickly with (II) than with (I), and with perfused frog's kidney the diuretic action is more regularly produced with (I) than (II).

P W

**Standard digitalis powder of the U.S.P.** C. W. EDMUNDS, C. A. MOYER, and J. R. SHAW (J. Amer. Pharm. Assoc., 1937, 26, 290—305).—Biological methods of assay of digitalis preps. are critically examined. Comparison of standard powders by these methods indicates that the order of decreasing potency is U.S.P., British, Canadian. F. O. H.

**Poisonous action of colloidal elements.** W. BILTZ (Kolloid-Z., 1937, 79, 222).—Historical (cf. Labes, this vol., 218). F. L. U.

**Pharmacology of arsenic and antimony.** H. A. OELKERS (Arch. exp. Path. Pharm., 1937, 184, 276—288).—Cathepsin, all serum- and organ-lipases of man and other animals, and muscle-esterase of rabbit are inhibited by As and by tartar emetic. The effect of these poisons on the vascular system is investigated. P. W. C.

**Glycæmic curve during experimental potassium cyanide poisoning.** F. DOMENICI (Boll. Soc. ital. Biol. sperim., 1937, 12, 30).—Administration of KCN produces first an increase in the reducing power of the blood and then a steady decrease to zero vals.; simultaneously the CN' content diminishes (cf. this vol., 29). Probably glucose cyanohydrin is formed. F. O. H.

**Histochemical detection of lead in the gastrointestinal tract.** H. SCHÖNLEBE (Arch. exp. Path. Pharm., 1937, 184, 289—295).—The mucous cells of the stomach and the goblet cells of the small and large

intestines of guinea-pigs poisoned with Pb are shown by treatment with  $\text{H}_2\text{S}$  to contain Pb, these cells probably serving as a means of excretion. P. W. C.

**Use of the allometric formula.** L. LAPICQUE (Bull. Soc. Chim. biol., 1937, 19, 434—440).—Polemical. E. A. H. R.

**Enzyme-substrate compounds in enzymic reactions.** G. MEDVEDEV (Enzymologia, 1937, 2, 1—8).—A theory of enzymic kinetics based on mol. statistical mechanics is advanced. Compounds between enzyme and substrate play a negative role in the mechanism of enzymic reactions. E. A. H. R.

**Energy of activation and temperature constants of enzymic reactions.** G. MEDVEDEV (Enzymologia, 1937, 2, 31—36).—The temp. coeff. of enzymic reactions decreases with increasing temp., as does the Arrhenius const.,  $A$ , whilst the energy of activation,  $E$ , varies but little. At low temp.  $A$  and  $E$  differ considerably but at higher, and optimal, temp. they have approx. the same vals. From the experimental vals. for  $A$  the true vals. for  $E$  for a series of enzymic reactions are calc. E. A. H. R.

**Dehydrogenase systems of muscle and Jensen sarcoma in the rat.** H. VON EULER, E. ADLER, and G. GÜNTHER (Z. physiol. Chem., 1937, 247, 65—78).—The lactic (I) and malic dehydrogenase (II) systems of extracts of the sarcoma do not differ (e.g., in their dependence on  $p_{\text{H}}$ ) from those of muscle extracts but the ratio (I) : (II) in sarcoma extracts is > that in muscle extracts. W. McC.

**Enzymic inactivation of codehydrogenase.** II. H. VON EULER, H. HEIWINKEL, and F. SCHLENK (Z. physiol. Chem., 1937, 247, IV—V; cf. this vol., 222).—Organs rapidly inactivate cozymase and dehydrocozymase, 90% inactivation being attained in rat muscle in 2 hr. Similarly codehydrogenase II is almost completely inactivated in about 3 hr. W. McC.

**Synthetic dehydrogenases.** W. LANGENBECK and L. WESCHKY (Ber., 1937, 70, [B], 1039).—2-Methylpyridine is superior to  $\text{C}_5\text{H}_5\text{N}$  in accelerating the decolorisation of methylene-blue by alanine in presence of isatin-4- and -6- but not of -5- or -7-carboxylic acid or of isatin. H. W.

**Colorimetric determination of the decolorisation of methylene-blue by dehydrogenase enzyme preparations.** H. J. PISTOR (Z. physiol. Chem., 1937, 246, 248—257).—An apparatus, depending on the use of a step-photometer, is described. Its application to the dehydrogenase activity of *Acetobacter peroxydans* indicates that the accelerating action of  $M/1000$ — $M/150$ -KCN is due to change in  $[\text{H}^+]$  (cf. Wieland and Pistor, A., 1936, 893) and that the dependence on  $p_{\text{H}}$  occurs in both  $\text{O}_2$  and  $\text{H}_2$ . F. O. H.

**Respiratory catalysis by  $\text{C}_4$  dicarboxylic acids.** K. LAKI, F. B. STRAUB, and A. SZENT-GYÖRGYI (Z. physiol. Chem., 1937, 247, I—II).—In respiratory catalysis, the use of cytochrome- $C$  (I) as indicator shows that the two stages of oxidation are successive and that  $\text{C}_4$  dicarboxylic acids take part in both. In the equilibrium mixture of fumaric (II) and malic acid (III), activation by succinic and malic dehydro-

genase causes transfer of 2 H from (III) to (II) with production of oxalacetic (IV) and succinic acid (V). (V) is then converted by (I) into (II) whilst (IV) is dehydrogenated by the nutrient medium to (III). The oxidation-reduction potential of the system (III)–(IV) is approx. equal to that of the system lactic acid– $\text{AcCO}_2\text{H}$ . W. McC.

**Degradation of citric acid.** C. MARTINS (Z. physiol. Chem., 1937, 247, 104—110).—In the enzymic degradation of citric acid (I) the following two-stage process probably predominates. (I) loses  $\text{H}_2\text{O}$  giving *cis*-aconitic acid (II) which probably takes up  $\text{H}_2\text{O}$  again giving isocitric acid (III). (II) and (III) are dehydrogenated to oxalosuccinic acid which loses  $\text{CO}_2$  (probably spontaneously) and so yields  $\alpha$ -ketoglutaric acid (IV). The final product is succinic acid produced by decarboxylation and dehydrogenation of (IV). (II) has been converted into (I) by citric dehydrogenase, which must consist of at least two components only one of which, viz., that which dehydrogenates (II) and (III), is a true dehydrogenase. The reactions (I)  $\rightarrow$  (II) and (II)  $\rightarrow$  (III) are reversible. W. McC.

**Crystalline catalase.** J. B. SUMNER and A. L. DOUNCE (Science, 1937, 85, 366—367).—The prep. from beef liver of cryst. catalase, agreeing in properties with preps. of other investigators (cf. A., 1927, 376; 1931, 123), is described. L. S. T.

**Aldehyde mutase.** (A) D. MICHLIN. (B) M. DIXON and C. LUTWAK-MANN (Nature, 1937, 139, 926—927, 927).—(A) A claim for priority (cf. this vol., 220).

(B) The claim is disputed.

L. S. T.

**Choline-esterase activity of human sera with reference to hyperthyroidism.** W. ANTOPOL, L. TUCHMAN, and A. SCHIFRIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 46—50).—Acetylcholine-esterase of serum is relatively high in cases of untreated hyperthyroidism. P. G. M.

**Distribution of choline-esterase in the sartorius muscle of the frog.** A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 41—43).—The concn. at the nerve endings is considerably > that of the aneural portion. H. G. R.

**Choline-esterase in the nerve endings of striated muscle.** A. MARNAY, B. MINZ, and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 43—47).—Further evidence is given for the presence of a high concn. of the enzyme at the nerve endings (cf. this vol., 139). H. G. R.

**Velocity of hydrolysis of some monoacid triglycerides under the influence of pancreatic extract.** II. Influence of reaction products and the constitution of the triglyceride on the velocity of hydrolysis. K. HOLWERDA, P. E. VERKADE, and A. H. A. DE WILLIGEN (Rec. trav. chim., 1937, 56, 382—408; cf. A., 1936, 297).—Comparative hydrolysis experiments are described with trioctoin (I), trinonoin, tridecain, and triundecain at an initial  $p_{\text{H}}$  of 8.3, 6.5, 5.0, and 4.0, respectively. The influence of the corresponding acids and of their Na soaps on the velocity of hydrolysis of (I) is compared under

various conditions. The neutralisation curves of these acids are obtained and their partition between aq. and lipid phases during hydrolysis is investigated. The four acids inhibited hydrolysis by pancreatic extract to the same extent. The constitution of the triglycerides had no direct and measurable influence, but had an indirect effect since the Na salts of the acids inhibited to very different extents. The mechanism of the inhibition is discussed. P. W. C.

**Enzymic ester syntheses.** E. A. SYM and W. SWIATKOWSKA (Enzymologia, 1937, 2, 79—80).—The enzymic synthesis is recorded of the Bu esters of malonic, succinic, glutaric, phthalic, lactic, and salicylic acids by the method previously described (A., 1936, 1298). E. A. H. R.

**Effect of various metals in the form of ionisable or complex salts on the activation of hepatic arginase by vitamin-C.** A. BADINAND (Compt. rend. Soc. Biol., 1937, 125, 283—284).—Arginase is not affected by vitamin-C but is activated by  $\text{Fe}^{II}$ ,  $\text{Fe}^{III}$ , and Mn, and inhibited by Ca and Cu.

H. G. R.

**Proteolytic enzymes. XIV. Nature of the enzymic degradation of proteins.** M. BERGMANN and C. NIEMANN (J. Biol. Chem., 1937, 118, 781—788; cf. A., 1937, II, 234).—Fibrin from ox blood digested for 20 days at 37° with papain and HCN yields tyrosine (I), tryptophan, leucine, isoleucine, and phenylalanine. Since (I) is produced also when digestion occurs in presence of  $\text{NHPh}\cdot\text{NH}_2$ , it follows that both the enzymes of papain liberate (I) from proteins. The view that proteinases degrade proteins at least partly to  $\text{NH}_2$ -acids is thus upheld.

W. McC.

**Differentiation of pancreatic trypsin on the basis of their specificities.** M. BERGMANN, J. S. FRUTON, and H. POLLOK (Science, 1937, 85, 410—411).—Cryst. trypsin readily hydrolyses  $\alpha$ -benzoyl-L-arginineamide, chymotrypsin, carbobenzyloxy-L-tyrosylglycineamide, and carbobenzyloxyglycyl-L-phenylalanyl-glycineamide, and heterotrypsin (I) hydrolyses benzoylglycyl-L-lysineamide. By means of these synthetic substrates determinations of each of the trypsin in presence of each other and of their respective biological activities can be made. Thus, commercial pancreatin contains much (I), to which its activity toward genuine proteins must be mainly due.

L. S. T.

**Preparation of trypsin-free aminopolypeptidase.** G. ÅGREN (Z. physiol. Chem., 1937, 246, 280—282).—Aminopolypeptidase preps. obtained by 30% glycerol extraction of the pyloric and duodenal mucosa of pigs contain respectively no and very little trypsin (cf. Linderstrøm-Lang *et al.*, A., 1935, 1025). Dipeptidase and, to a much smaller extent, aminopolypeptidase in the preps. are adsorbed by  $\text{Fe}(\text{OH})_3$ .

F. O. H.

**Dilatometric ultra-micro-determination of peptidase activity.** K. LINDERSTRØM-LANG (Nature, 1937, 139, 713—714).—The falling drop method for the determination of  $d$  has been applied on the micro-scale to the determination of enzymic activity. Curves showing the change in  $d$  with time

and the amount of  $\text{NH}_2$ -N liberated are given for mixtures of *dl*-alanylglycine and peptidase.

L. S. T.

**Yeast amylase. IV. Properties. Optimum  $p_H$  and temperature.** K. ONO (J. Agric. Chem. Soc. Japan, 1935, 11, 803—807; cf. A., 1935, 1415).—Amylase from yeast [by  $(\text{NH}_4)_2\text{HPO}_4$ ] showed optimum starch hydrolysis with  $p_H$  6.2—6.6 at 22.5° and 6.0—6.2 at 30°. Optimum temp. was 25—30° at  $p_H$  6.4.

CH. ABS. (p)

**Koji amylase. VI. Formation of amylase, maltase, and protease during cultivation of saké-koji. VII. Effects of cultivation temperature and degree of polishing of rice on formation of amylase, maltase, and protease in saké-koji. VIII. Fluctuation of amylase during cultivation of yeast preparations (moto).** Y. TOKUOKA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 275—280, 281—285, 313—317).—VI. The enzyme prep. is obtained by extracting saké-koji with 1% NaCl for 3—5 hr. at room temp.; longer times or higher temp. cause destruction of the enzymes. The relative amounts of amylase (I), maltase (II), and protease (III) are const. at any stage of cultivation of saké-koji.

VII. Saké-koji from unpolished rice contains the highest concn. of (I), but very little difference occurs in the relative amounts of (I), (II), and (III) for various degrees of polishing. The enzymic activity, especially that of (II), is decreased by cultivation of the koji at 48—51° instead of 30—45°.

VIII. The fluctuation in the amounts of (I) is very similar to that of saké mash. The total amount of (I) is decreased during cultivation owing to rise of temp. and production of acid and EtOH.

J. N. A.

**Enzymes of grain. III. Relation between the action of the starch-liquefying enzyme of rice and  $p_H$ .** G. YAMAGISHI (J. Agric. Chem. Soc. Japan, 1935, 11, 825—835; cf. A., 1936, 1418).—The optimum  $p_H$  of aq. and salt extracts and dialysates of polished and unpolished rice are determined.

CH. ABS. (p)

**Amylase in subcutaneous adipose tissue.** F. CEDRANGOLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 12).—A slight amylase activity was detected in the tissue (dog).

F. O. H.

**Action of taka-diastase on the monophosphoric esters of *n*- and *iso*-propyl alcohol.** J. COURTOIS and P. DENIS (Bull. Soc. Chim. biol., 1937, 19, 496—507).—Modifications in the syntheses of  $\text{Pr}^n\text{H}_2\text{PO}_4$  (I) and  $\text{Pr}^i\text{H}_2\text{PO}_4$  (II) are described. The  $p_H$  optimum of the hydrolysis of (I) and (II) becomes less acidic as the substrate concn. increases. Taka-diastase has a greater affinity for (II) than for (I), but (I) is hydrolysed more rapidly. The affinity of the phosphatase for (I) and (II) increases with acidity.

E. A. H. R.

**Kinetic theory of invertase action.** G. MEDVEDEV (Enzymologia, 1937, 2, 53—72).—A theory for the mechanism of enzyme reactions is advanced, based on the assumption of inelastic collisions of the second order between mols. An equation for the kinetics of invertase action is developed which fits the experi-

mental facts. The theory accounts for the abnormal temp. coeffs. of enzymic reactions, for which an exact formulation is given, and enables the abs. magnitude of the velocity of enzymic reactions to be calc.

E. A. H. R.

**Role of active acidity in the enzymic inversion of sucrose.**—See A., I, 368.

**Phosphorylation and oxido-reduction during the degradation of glucose in the brain.** E. ADLER, F. CALVET, H. VON EULER, and G. GÜNTHER (Naturwiss., 1937, 25, 282).—The glycolytic enzyme system of brain tissue resembles those of embryonic tissue and of tumours, and differs from the muscle-enzyme in that it can effect the glycolysis of glucose (I) itself. The first stage in the glycolysis of (I) by the brain-enzyme is accompanied by the disappearance of the labile adenosine triphosphate and probably involves phosphorylation. Other evidence indicates that phosphorylated products are intermediaries in the production of lactic acid (II) from (I) in presence of the brain-enzyme. The inhibiting effect on (II) production of glyceraldehyde is characteristic of the brain, tumour, and embryonic tissue enzymes as contrasted with the muscle systems. W. O. K.

**Phosphatases and activation by magnesium salts. II. "Alkaline" phosphatase of the placenta.** C. CATTANEO, G. SCOZ, and M. C. GABRIELLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 37—38; cf. Busse, A., 1936, 1420).—In its action on 0.2*M*-Na  $\beta$ -glycerophosphate at 9.4, the enzyme is activated (or a natural inhibitor is suppressed) by  $\text{MgSO}_4$  (optimum concn. 0.0022*M*). F. O. H.

**Activation of alkaline phosphatase by magnesium salts.** C. CATTANEO, M. C. GABRIELLI, and G. SCOZ (Enzymologia, 1937, 2, 17—30).—The action of  $\text{Mg}^{++}$  on alkaline phosphatase (I) is slight and temporary when (I) concn. is high and when the glycerophosphate is nearly in equilibrium with its products of decomp. With very low (I) concns. the effect of  $\text{Mg}^{++}$  is much larger and may increase with time. The addition of  $\text{Mg}^{++}$  retards the rate of inactivation of (I) but cannot reactivate completely exhausted (I) preps. Equations are developed for the course of the enzymic reaction with preps. of varying activity, and for the relation between extent of reaction, (I) concn., and the duration of the reaction. E. A. H. R.

**Phosphatase in adipose tissue.** M. SAVIANO (Enzymologia, 1937, 2, 43—46).—A phosphatase, cleaving hexose diphosphate, occurs in the adipose tissue of the dog. The activity is  $>$  that of glycerophosphatase but the  $p_H$  optimum of the two enzymes is the same. E. A. H. R.

**Action of alkali on cozymase.** R. VESTIN and H. VON EULER (Z. physiol. Chem., 1937, 247, 43—51).—Cozymase (I) is converted from a monobasic into a tribasic acid by heating with dil. (e.g., 0.05*N*) alkali at 95° for  $<40$  min. Intact (I) in alkaline solution combines with 7—8 equivs. of I per mol. but after heating with 0.05*N*-NaOH the val. is 3 equivs. whilst inorg.  $\text{PO}_4'''$  is liberated, an acid-labile phosphoric ester (II) produced, and fermenting power destroyed. The inactive material obtained

contains an adenine residue readily eliminated by acid. The changes in I combination and the production of acidic groups and (II) proceed in parallel.

W. McC.

**Action of alkali on cozymase.** F. SCHLENK, H. VON EULER, H. HEIWINKEL, W. GLEIM, and H. NYSTRÖM (Z. physiol. Chem., 1937, 247, 23—33).—Cozymase (I) has no  $\text{PO}_4'''$ -carrying power. A method of separating (I) from accompanying adenylic acid (II) and a procedure for determining  $\text{PO}_4'''$  carriers in systems containing (I) are described. An account is given of the probable course of the concurrent or successive reactions believed to occur when dil. aq. NaOH (hot or cold) acts on (I) with production of nicotinamide and, possibly (II), adenosinediphosphoric acid, and other substances. W. McC.

**Adenosinediphosphoric acid from cozymase.** H. VON EULER, F. SCHLENK, and R. VESTIN (Naturwiss., 1937, 25, 318).—A preliminary announcement of the isolation of adenosinediphosphoric acid after alkaline hydrolysis of cozymase. P. W. C.

**Role of manganese for the phosphate-transfer function of cozymase.** P. OHLMEYER and S. OCHOA (Naturwiss., 1937, 25, 253).—Small amounts of Mn (0.1—1.0  $\times 10^{-3}\%$ ) activate the transfer of  $\text{PO}_4'''$  from phosphopyruvic acid to glucose by cozymase (I) without any detectable formation of (I) pyrophosphate. Mn also activates adenylic acid, adenylyl pyrophosphate, and alkali-inactivated (I) in their phosphorylating effects and can replace the  $\text{Mg}^{++}$  necessary for the phosphorylation.

E. A. H. R.

**Effect of manganese on the action of cozymase, adenylic acid, and cocarboxylase.** H. VON EULER, E. ADLER, G. GÜNTHER, and R. VESTIN (Z. physiol. Chem., 1937, 247, 127—134; cf. preceding abstract).—In muscle extract production of lactic acid (I) occurs only when cozymase (II) and adenylic acid (III) are present together. (II) alone does not cause production of (I) even when  $\text{Mn}^{++}$  is added, but  $\text{Mn}^{++}$  activates the glycolysis when (III) and sub-optimal amounts of (II) are present. Catalysis of the production of inorg.  $\text{PO}_4'''$  from phosphoglyceric acid (IV) by (III) in the extract is inhibited by  $\text{Mn}^{++}$ , which does not confer on (II) the power to stimulate the action.  $\text{Mn}^{++}$  also diminishes the interchange of  $\text{PO}_4'''$  between phosphocreatine and cophosphorylase, but greatly accelerates the fermentation of (IV) by yeast maceration juice in presence of (III) although the acceleration is much less pronounced when (II) replaces (III). In the system EtOH—alcohol-apodehydrogenase—(II) production of dihydrocozymase is not accelerated by  $\text{Mn}^{++}$ . W. McC.

**Yeasts in the normal mouth.** F. C. LAWLER (Amer. J. Pharm., 1937, 109, 167—182).—Two types of yeasts were found in 80% of the normal mouths examined. H. G. R.

**Nitrogen assimilation of yeast. VIII. Excretion of nitrogen during growth.** N. NIELSEN and V. HARTELIUS (Compt. rend. Lab. Carlsberg, 1937, 22, Ser. physiol., 23—47; cf. A., 1936, 1300).—No excretion of  $\text{NH}_3$  from yeast occurs during growth on sugar-containing media (with a little wort as

source of bios) when glycine or  $(\text{NH}_4)_2\text{SO}_4$  is the available source of N. With excess of  $(\text{NH}_4)_2\text{SO}_4$ , N excretion is greatest when growth is most active, ceases when the sugar is exhausted, and increases again when autolysis sets in; the excretion during growth is fairly const. (approx.  $\frac{1}{3}$  of the N assimilated), whilst excretion during autolysis is more variable. With only small amounts of  $(\text{NH}_4)_2\text{SO}_4$ , the excretion during growth is smaller, being dependent on the N content of the yeast. Excretion of N during growth is  $>$  that during autolysis. I. A. P.

**Ammonium salts and amino-acids as nitrogen sources in the production of pressed yeast.** F. WAGNER (Zentr. Bakt. Par., 1936, II, 93, 359—371).—Yields of yeast were increased by addition of "yeast-vitamin" (completin) from fresh plants to sugar- $\text{NH}_4$  salt media. Mixtures of  $\text{NH}_2$ -acids afforded a better source of N than did asparagine, which, in turn, was superior to  $\text{NH}_4^+$  salts. Differences are ascribed partly to better utilisation of  $\text{NH}_2$ -acids and partly to the diminution of the  $\gamma$  of the medium with consequent improved aeration. A. G. P.

**Urease of yeast.** K. SAKAGUCHI and Y. SHIZUME (Bull. Agric. Chem. Soc. Japan, 1937, 13, 309—313).—Of 62 species of yeast, 8 produced  $\text{NH}_3$  in a medium containing urea as sole source of N. Ureolysis was also shown with yeast autolysates in presence of PhMe. J. N. A.

**Reducing power of living yeasts during alcoholic fermentation.** C. FROMAGEOT and G. BOST (Compt. rend., 1937, 204, 1008—1010; cf. A., 1936, 1300).—The  $r_H$  developed by different consns. of *Saccharomyces cerevisiae*, at different  $p_H$ , in 10—20% aq. sucrose at 28° is determined by an indicator method. Wide variations in the consn. of yeast (10—0.25%) at any  $p_H$  leaves the final  $r_H$  unchanged, but as the  $p_H$  and the yeast consn. diminish, the  $r_H$  usually increases. J. L. D.

**Biocatalytic activators specific for the yeast fermentation of maltose.** M. J. BLISH and R. M. SANDSTEDT (J. Biol. Chem., 1937, 118, 765—780; cf. B., 1934, 167, 858).—Fresh bakers' pressed yeast usually has little power to ferment pure maltose but dried yeast and flour (especially from malted wheat) contain accelerators of fermentation which greatly reduce or eliminate the induction period, and increase the rate and completeness of fermentation. The activator of flour resembles von Euler's factor Z (cf. A., 1925, i, 209) which possibly also occurs in yeast, but dried yeast contains also a factor M, unstable towards heat and EtOH. W. McC.

**New inorganic phosphorus compound in yeast and the composition of adenosinepolyphosphoric acids.** K. GIBAYLO and B. UMSCHWEIF (Compt. rend. Soc. Biol., 125, 275—277).—From the  $\text{CCl}_3\cdot\text{CO}_2\text{H}$  extract of bakers' yeast a *polyphosphoric acid*, probably  $\text{H}_6\text{P}_4\text{O}_{13}$ , has been obtained. H. G. R.

**Preparation of hexose monophosphate from yeast extract.** C. V. SMYTHE (J. Biol. Chem., 1937, 118, 619—625).—Details are given of a method involving the addition of a dye (rosinduline GG) (A., 1936, 759) to the fermentation mixture, whereby

a yield of 25 g. of a cryst. Ca salt is obtained from 250 g. of dried yeast. After removal of Ca glycerophosphate as a 1:1 mixture with hexose monophosphate, 20 g. of Ca hexose monophosphate are obtained; this product is a mixture of glucose, fructose, and mannose monophosphates.

P. G. M.

**Fermentative determination of sugar in Warburg's apparatus.** G. WEICHSEL (Planta, 1936, 26, 19—27).—The technique aims to reduce errors arising from non-uniformity of fermentative power of yeast cultures by introducing a control fermentation. A. G. P.

**Carbohydrates of yeast.** K. SILBEREISEN (Z. Spiritusind., 1937, 60, 124—126, 129—130).—A lecture.

**Yeast mannan.**—See A., II, 277.

**Chemical factors influencing growth and pigmentation of certain micro-organisms.** M. S. KHARASCH, E. A. CONWAY, and W. BLOOM (J. Bact., 1936, 32, 533—540).—Large consns. of biologically catalytic metals ( $\text{Mn}^{++}$ ,  $\text{Cu}^{++}$ ,  $\text{Fe}^{+++}$ ) inhibit the growth of bacteria, yeasts, and fungi, whereas smaller consns. may cause loss of pigmentation. The toxic effect of Cu on sensitive organisms is counteracted by addition of liver extract to the medium. Fixation of metals by liver extract may cause inhibition of growth by restricting the supply of necessary metals to the organism. Development of pigment in cultures of *Serratia marcescens* does not specifically require glucose in the medium but depends on the presence in it of substances containing available  $\cdot\text{CHO}$  or  $\cdot\text{CO}$  groups. Pigmentation in many organisms is inhibited by  $\text{NHPh}_2$ . A. G. P.

**Physico-chemical characters of sexuality in fungi.** P. JOYET-LAVERGNE (Protoplasma, 1936, 26, 1—19).—The chondriome of the male gamete shows higher oxidative power and constitutes a larger proportion of the cytoplasm than that of the female gamete. The fatty constituents of the female cell reduce osmic acid; those of the male cell do not. M. A. B.

**Substitutes for potassium in metabolism of lower fungi.** O. RAHN (J. Bact., 1936, 32, 393—399).—Rb can replace K in culture media for certain yeasts, mycobacteria, and aerobic sporing bacteria, but yields are diminished. Na, Li, or bivalent radioactive elements cannot serve as substitute for K. Gram-negative bacteria (except *Rhizobium*) can grow without K. The radioactivity of K is probably a factor in the growth of micro-organisms. A. G. P.

**Production of fat by moulds and bacteria.** W. SCHWARTZ (Angew. Chem., 1937, 50, 294—296).—The relations between conditions of culture and fat formation found by various authors are summarised. Generally, the factors which increase the yield of fat are: high C and N contents of nutrients, high temp., and a plentiful supply of  $\text{O}_2$ . T. G. G.

**Energy exchange in *Aspergillus niger* as influenced by the supply of potassium.** A. RIPPPEL and G. BEHR (Arch. Mikrobiol., 1936, 7, 315—322).—The energy consumption per g. of

mycelium was higher when the K supply was adequate than when it was deficient. A. G. P.

**Acid production and acid-resistance of *Aspergillus niger*.** H. KARDO-SYSSOJEVA (Zentr. Bakt. Par., 1936, II, 93, 264—277).—Media containing HCl affect the organism by (i) direct activation, (ii) after-effects which induce modification during prolonged subculturing, (iii) increasing the stability of active cultures which incline towards a spontaneous degeneration. Changes in morphological characteristics of a strain are reflected in modifications of acid-producing properties. A. G. P.

**Aerobic decomposition of cellulose.** L. M. HOROVITZ-VLASOVA (Zentr. Bakt. Par., 1936, II, 93, 347—358).—Various cellulose-decomp. organisms are isolated from soil. Of these, *Aspergillus* spp. were the most active and produced  $\text{CO}_2$  and sol. substances (not sugars, aldehydes, acids, pentosans, or oxycellulose) which were utilisable by various bacteria. A. G. P.

**Detoxication of sulphuric acid in cultures of *Aspergillus niger*.** A. RIPPET and G. BEHR (Arch. Mikrobiol., 1936, 7, 584—589).—In cultures of *A. niger* in which K is supplied as  $\text{K}_2\text{SO}_4$ , 60% of the  $\text{SO}_4^{2-}$  may be removed from the medium by the mould, especially in presence of much sugar. Autolysis of the mycelium yields large proportions of org. S. With KCl as K source no fixation of Cl takes place. A. G. P.

**Influence of zinc, iron, copper, and of combinations of these on the growth of *Aspergillus niger*.** F. GOLLMICK (Zentr. Bakt. Par., 1936, II, 93, 421—442).—Although in general Zn favours the vegetative growth and Fe the fructification of *A. niger*, under certain conditions Zn, Fe, and Cu are similarly effective in increasing both vegetative growth and fructification.  $\text{Fe}^{II}$  and  $\text{Fe}^{III}$  are equally active. The inhibitory action of excessive amounts of Zn is partly counteracted by  $\text{CaCO}_3$ . Fe lowers the toxicity of heavy Zn dosages in respect of fructification but increases it in respect of mycelial growth. Formation of the black spore pigment depends on an oxidation process which is catalysed by Cu. The toxic effects of Cd are diminished by high concns. of Fe. A. G. P.

**Decomposition and utilisation of verbenalolide by *Aspergillus niger*.** J. CHEYMOL (Bull. Soc. Chim. biol., 1937, 19, 460—465).—*A. niger*, grown in aq. verbenalolide, decomposes it into verbenalol and glucose, the latter being utilised and the former either remaining in solution or being adsorbed by the mycelium. E. A. H. R.

**Nitrogen metabolism of a micro-organism from the viewpoint of the law of allometry.** W. H. SCHOPFER (Compt. rend., 1937, 204, 1127—1129).—The law of allometry is applicable to the decline in N content of *Phycomyces* with advancing development, the level of development in experiments described being controlled by the amount of vitamin- $B_1$  given. The influence of varying levels of N supply is examined. A. G. P.

**Vitamins and growth factors in plants. Activity of oxidation products of vitamin- $B_1$ .**

W. H. SCHOPFER and A. JUNG (Arch. Mikrobiol., 1936, 7, 571—578).—Oxygenated  $\text{H}_2\text{O}$  destroys the activity of cryst. vitamin- $B_1$  towards *Phycomyces* and animals and also that of wheat germ towards *Phycomyces* and yeast. Thiochrome obtained by oxidation of  $-B_1$  with  $\text{K}_3\text{Fe}(\text{CN})_6$  has no action on animals and little or none on *Phycomyces*.  $-B_1$  and bios cannot be separated by oxidation processes. A. G. P.

**Presence of chitin in micro-organisms.** M. SCHMIDT (Arch. Mikrobiol., 1936, 7, 241—260).—The chitin (I) content of various organisms is recorded. In Mucorineæ the (I) content in acid is  $>$  that in alkaline media. The decrease in (I) during autolysis depends on the temp. and reaction of the medium; in acid media  $\text{H}_2\text{C}_2\text{O}_4$  is produced. A. G. P.

**Potassium permanganate as an aid to the production of asexual fructification by *Phytophthora erythroseptica*.** Pethybr. R. MCKAY (Nature, 1937, 139, 802).—The addition of small amounts of dil. aq.  $\text{KMnO}_4$  accelerates the formation of conidia. L. S. T.

**Phytoplankton in the Bay of Fundy and Gulf of Maine.** H. H. GRAN and T. BRAARUD (J. Biol. Board Canad., 1935, 1, 279—467).—Variations with depth in P and  $\text{NO}_3^-$  contents and  $\text{O}_2$  saturation are examined in relation to photosynthetic activity of plankton and the possible influence of dam construction. CH. ABS. (p)

**Metabolism of protozoa. III. Properties of a proteolytic extract obtained from *Glaucoma piriformis*.** N. R. LAWRIE (Biochem. J., 1937, 31, 789—798; cf. A., 1935, 1419).—A protease is isolated from the cells of *G. piriformis* and shown to contain a proteinase of the papainase group. The protease digests caseinogen, gelatin (optimum  $p_H$  6), and  $\alpha$ -glutelin readily and ovalbumin very slowly. It is activated slightly by  $\text{CN}^-$  at  $p_H$  7 but is inactivated by free HCN. The effects of concn. of enzyme and substrate, and duration of action, on the extent of proteolysis are investigated. P. W. C.

**Action of small amounts of agar on growth and nitrogen fixation of *Azotobacter* and on other microbiological processes.** A. I. VIRTANEN (Arch. Mikrobiol., 1936, 7, 488—489).—Observations similar to those of Rippel (this vol., 35) were previously recorded by Virtanen and Pulkki (A., 1933, 535). A. G. P.

**Action of iron, agar, and humus on *Azotobacter*.** A. RIPPET (Arch. Mikrobiol., 1936, 7, 590—597).—Agar increases the action of  $\text{FeSO}_4$  in stimulating the growth and N fixation of *A. chroococcum*. With addition of Mo this effect becomes  $>$  that produced by humus preps. The action depends on the colloidal properties of the agar. A. G. P.

**Influence of iron and molybdenum on nitrogen fixation by *Azotobacter chroococcum*.** Beij. S. KRZEMIENIEWSKI and J. KOVATS (Bull. Acad. Polonaise, 1936, B, 169—195).—A strain of *A. chroococcum* showing poor N-fixing ability became much more active on addition of humus material or its ash. Neither  $\text{NaMoO}_4$  nor Fe salts alone had any

appreciable effect but simultaneous treatment with both markedly increased the amount of N fixed.

A. G. P.

**Metabolism of *Azotobacter chroococcum*. I. Variability of the oxidation-reduction system with cultures on different media.** R. NILSSON (Arch. Mikrobiol., 1936, 7, 598—612).—*A. chroococcum* grown on glucose media contains much cozymase and in the course of fermentation probably utilises hexose diphosphate as H donator. In many respects the enzyme system resembles that of yeast. When cultured on glucose- and then transferred to mannitol-media *Azotobacter* grows at an accelerated rate and retains cozymase after repeated subculturing. The mechanism of the metabolic changes is discussed.

A. G. P.

**Cell inclusions in *Azotobacter chroococcum*, Beij.** A. BONAZZI (Science, 1937, 85, 385).—The results reported by Lewis (this vol., 146) are confirmed.

L. S. T.

**Physiology of *Rhizobium*. VIII. Respiratory quotient.** D. W. THORNE, O. R. NEAL, and R. H. WALKER (Arch. Mikrobiol., 1936, 7, 477—487; cf. A., 1936, 1559).—The R.Q. (24 hr. after inoculation) of *R. japonicum* and *R. leguminosarum* was < that of *R. meliloti*, *R. trifolii*, and *R. phaseoli* in glucose media and with 4 different N sources. No differences were apparent in media containing the same sources of N but no sugar. With yeast extract or asparagine as N source in glucose- or no-sugar-media, the R.Q. of all species was < when N was supplied as  $\text{NaNO}_3$  or  $\text{NH}_4\text{Cl}$ . Yeast extract produced greater stimulation of growth and respiration than any other N source examined. Root-nodule organisms benefit from the action of reducing substances. A. G. P.

**First stages of decomposition of cellulose by *Spirochaeta cytophaga*.** M. S. LOICJANSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 381—384).—The first stage of decomp. is probably an oxidation to polyglycuronic acids.

A. G. P.

**Variability in the fire-blight organism *Erwinia amylovora*.** P. A. ARK (Phytopath., 1937, 27, 1—28).—Differences in cultural characteristics and in ability to utilise nutrient materials among variants of *E. amylovora* are examined. Injection of asparagine into resistant or dormant plants facilitates subsequent infection. A. G. P.

**Fermentation of glycerol by gluconic acid bacteria in fruits. Production of dihydroxyacetone, glyceric, acetic, glycollic, and succinic acids, and a substance which gives a reddish-violet colour reaction with ferric chloride.** T. TAKAHASHI and T. ASAI (J. Agric. Chem. Soc. Japan, 1935, 11, 1008—1016).—The products of fermentation of glycerol (I) by *Gluconoacetobacter cerinus*, var. *ammoniacus* f. sp. unshu 8, in yeast- $\text{CaCO}_3$  media are examined. (I) may be converted into an unknown keto-acid through  $\text{CO}(\text{CH}_2\text{OH})_2$  or into succinic or glycollic acid through glyceric acid and AcOH.

CH. ABS. (p)

**Fermentation products of acetic acid bacteria associated with fruits. Formation of galactonic and komenic acid from galactose.** T. TAKAHASHI and T. ASAI (Zentr. Bakt. Par., 1936, II, 93, 248—

252).—These acids were produced from galactose by acetic bacteria isolated from fruits. A. G. P.

**Nitrogenous nutrition of certain species of propionic acid bacteria.** C. FROMAGEOT and E. L. PIRET (Arch. Mikrobiol., 1936, 7, 551—570).—*Propionibacterium zeæ*, *P. pentoaceticum*, and *P. Thonii* utilise N supplied as  $\text{NH}_4\text{OAc}$  in glucose media containing extract of polenta as an essential activator. *P. Freudenreichii*, *P. technicum*, and *P. Shermani* are unable to do so, probably through deficiency of a growth factor. Change of C source to  $\text{AcCO}_2\text{H}$  alters the relative rates of growth of the three first named organisms. With lactic acid as C source *P. pentoaceticum*, *P. zeæ*, and *P. Shermani* but not the other three species utilise  $\text{NH}_4\text{OAc}$ . No acidity develops in lactate or pyruvate media,  $\text{EtCO}_2\text{Na}$ ,  $\text{NaOAc}$ , and  $\text{CO}_2$  being produced. In glucose-polenta extract media *P. zeæ* does not utilise  $(\text{NH}_4)_2\text{SO}_4$ ,  $(\text{NH}_4)_2\text{CO}_3$ ,  $(\text{NH}_4)_2\text{C}_2\text{O}_4$ ,  $\text{NH}_4\text{NO}_3$ , or  $\text{HNO}_3$ . Tryptophan, asparagine, and alanine serve as simultaneous sources of C and N for *P. zeæ* and growth (although < that obtained with glucose- $\text{NH}_4\text{OAc}$ ) under these conditions is unaffected by the presence of glucose.

A. G. P.

**Influence of traces of oxygen on glycolysis by *Propionibacterium pentosaceum*.** P. CHAIX (Compt. rend., 1937, 204, 911—913; cf. A., 1936, 248, 1561).—Removal, by P or  $\text{CrCl}_2$ , of traces of  $\text{O}_2$ , or addition of small quantities of HCN ( $5 \times 10^{-5}M$ ), allows small quantities of these bacteria to metabolise glucose at the same rate as do larger quantities;  $\text{O}_2$  is thus responsible for the inhibition previously observed when < min. amounts of these bacteria are used.

F. A. A.

**Oxidation and fermentation of glucose by *Propionibacterium pentosaceum*.** P. CHAIX (Compt. rend., 1937, 204, 1005—1008).—The  $\text{CO}_2$  evolved under aerobic conditions is  $\frac{1}{2}$  under anaerobic; in the former case, fermentation of glucose is diminished. Cystine, cysteine, and  $\text{H}_2\text{S}$  have no inhibitory effect on respiration, and HCN inhibits it only in concns.  $>0.001N$ . This effect is different from the oxidation of the glycolytic system of the organism (see above).

J. L. D.

(A) **Biochemistry of methane fermentation.** (B) **Methane-producing bacteria.** H. A. BARKER (Arch. Mikrobiol., 1936, 7, 404—419, 420—438).—(A) Bacterial production of  $\text{CH}_4$  is effected by direct reduction of  $\text{CO}_2$  in the presence of H donators, e.g.,  $\text{EtOH}$ ,  $\text{BuOH}$ , which are themselves converted into  $\text{AcOH}$  and  $\text{PrCO}_2\text{H}$  (I), respectively. (I) is further dehydrogenated to  $\text{AcOH}$  with additional formation of  $\text{CH}_4$ .  $\text{AcOH}$  probably undergoes a similar dehydrogenation of the same type, the change being masked by the formation of  $\text{CO}_2$  as the product of dehydrogenation.

(B) Four species of non-sporing  $\text{CH}_4$ -producing bacteria are isolated and their biochemical activities are described.

A. G. P.

***Bacterium bifidum* and *Thermobacterium intestinale*.** S. ORLA-JENSEN, A. D. ORLA-JENSEN, and O. WINTHER (Zentr. Bakt. Par., 1936, II, 93, 321—343).—The cultural characteristics and ferment-

ative activities of these organisms together with their distribution in faeces are examined. A. G. P.

**Bacterial growth at constant  $p_H$ . Apparent oxidation-reduction potential, acid production, and population studies of *Lactobacillus acidophilus* under anaerobic conditions.** L. G. LONGSWORTH and D. A. MACINNES (J. Bact., 1936, 32, 567—585).—The essential character of  $CO_2$  for growth of the organism under anaerobic conditions is confirmed. During growth  $E_h$  decreases and ultimately attains a const. val. which is characteristic of the species. Maintenance at  $p_H$  6 in cultures results in a 4-fold increase in bacterial nos. and a 9-fold increase in acid production. Au electrodes are more sensitive than Pt electrodes to  $E_h$  changes in these systems.

A. G. P.

**Influence of the composition of the medium on the metabolism of some slow lactose-fermenting bacteria of intestinal origin.** A. D. HERSHEY and J. BRONFENBRENNER (J. Bact., 1936, 32, 519—531).—Rates of multiplication and lactose (I) decomp. by these organisms are markedly influenced by the concn. of (I) in the medium. Presence of Na succinate as supplementary source of C does not influence the early fermentation of (I) except by its buffer action. Succinic acid (II) is removed from the medium more rapidly as the ratio of the concns. of (II) : (I) is increased.

A. G. P.

**Symbiotic function of *Oidium lactis*.** J. B. LINNEBOE and E. G. HASTINGS (Zentr. Bakt. Par., 1936, II, 93, 278—290).—Undesirable odours produced in milk by *O. lactis* are influenced by symbiotic relationships between this and other organisms, notably *B. mesentericus*. This symbiosis results in a decrease in the  $[H^+]$  of the medium and is attributed to the proteolytic and acid-consuming activities of *Oidium*. Changes in oxidation-reduction potential and the increase in protein decomp. vary with the nature of the bacteria concerned.

A. G. P.

**General and biochemical characters of forty strains of mucous bacteria.** LEVY-BRUHL and Y. CADO [with HURI] (Ann. Inst. Pasteur, 1937, 58, 498—530).—The morphology and physiology of capsule-forming bacteria of the *Klebsiella* and *Aerobacter* type are described. Unusual features demonstrated for certain strains are autolysis, chromogenesis, motility, gelatin liquefaction, bipolar staining, and marked size variation. Some strains are capable of using  $NH_4$  salts as N source, and some can use EtOH or AcOH as source of C.

L. D. G.

**Production of mucilage by bacteria. I. Classification of Natto-bacillus.** Y. GO and S. NAKAMURA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 295—304).—Fifty-two strains of Natto-bacillus have been classified. Their ability to produce mucilage was determined by measurement of the viscosity of culture media of soya-bean extracts.

J. N. A.

**Metabolism of Thiorhodaceæ.** C. B. VAN NIEL (Arch. Mikrobiol., 1936, 7, 323—358).—Thiorhodaceæ do not liberate  $O_2$  during photosynthesis and like Athiorhodaceæ utilise  $H_2$  and org. substances in the assimilation process. Production of  $H_2S$  by Thiorhodaceæ in the dark is small; it depends on the

amount of S stored in cells and is attributable to phytochemical reduction. In media containing sufficient  $NaHCO_3$  to maintain a slightly alkaline reaction, lower fatty acids [up to  $EtCO_2H$  (I)] are immediately assimilated; this occurs only in the presence of inorg. salts. Assimilation of  $CO_2$  in the presence of (I) is facilitated by  $S_2O_3^{2-}$  but not by  $SO_4^{2-}$ . Production of acid by Thiorhodaceæ occurs both in darkness and in light.

A. G. P.

**Enzyme formation in bacteria.** J. H. QUASTEL (Enzymologia, 1937, 2, 37—42).—The relative endocellular enzymic contents of *M. lysodeikticus* and their variations with nutrition are investigated, using suspensions of the bacteria lysed by egg-white. Urease content is high in a medium rich in glucose (I), but low in one containing urea. (I) diminishes, whilst urea increases, catalase activity. Fumarase formation may be retarded by the presence, in the medium, of its substrate. The classification of adaptive and constitutive enzymes is inadequate to explain these results.

E. A. H. R.

**Changes in electrokinetic potential of bacteria at various phases of the culture cycle.** L. S. MOYER (J. Bact., 1936, 32, 433—464).—Electrophoretic mobilities of R and S forms of *Escherichia coli* are examined. In buffers of const. ionic concn. no differences of mobility of the S form occurred between  $p_H$  4.0 and 7.0. Bacterial surfaces are subject to the physico-chemical principles which govern non-living surfaces.

A. G. P.

(A) Growth-promoting and -inhibiting substances present in brilliant-green-bile media. (B) Increased growth and gas production by *Escherichia-Aerobacter* organisms in brilliant-green-bile media containing sodium formate. C. N. STARK and L. R. CURTIS (J. Bact., 1936, 32, 375—384, 385—391).—(A) The counter-effects of brilliant-green (I) (inhibitory) and of bile salt (II) (stimulatory) on certain bacterial cultures are examined. Protein material, e.g., milk, lowered the inhibitory effect of (I). The bearing of the results on bacterial tests of milk are discussed.

(B) The customary (I)-(II) medium does not eliminate all organisms which vitiate results of bacteriological examination of  $H_2O$  or milk. Addition to the medium of 0.5% of  $HCO_2Na$  increased the rate of growth of *Escherichia-Aerobacter* organisms, the no. of organisms developing, and the rate and amount of gas production without materially affecting the growth of organisms which produce false tests.

A. G. P.

**Sugar alcohols. VI. Utilisation of sugar alcohols and their anhydrides by various micro-organisms.** K. P. DOZOIS, C. J. CARR, J. C. KRANTZ, jun., F. HATCHEL, and F. F. BECK (J. Bact., 1936, 32, 499—503; cf. A., 1936, 113).—Further confirmation is given for the observation that the formation of the anhydride from sugar alcohols prevents their utilisation by many *coli-aerogenes* organisms. Polygalitol (1 : 5-anhydromannitol) is an exception to this rule. The inability of "intermediates" to ferment propylene glycol may permit differentiation of this group of organisms from *Escherichia* and *Aerobacter*.

A. G. P.

**Influence of halogenated acetic acids on the decomposition of hexose by *Bacterium coli*.** M. MICHAELIS (Suomen Kem., 1937, 10, B, 10—12).—The inhibitory action of the acids on *B. coli* in glucose media at  $p_H$  7.6 was in the descending order  $CH_2I \cdot CO_2H$ ,  $CH_2Br \cdot CO_2H$ ,  $CH_2Cl \cdot CO_2H$ . The limiting concns. of the acids affecting the growth of the organisms are the same as those affecting fermentation. The effect of the acids on the proportion of acid products of fermentation is examined. A. G. P.

**Spontaneous agglutination of *B. coli*.** G. MAGHERU, A. MAGHERU, and E. BARBULESCU (Compt. rend. Soc. Biol., 1937, 125, 310—312).—Agglutination is a min. in 0.7% aq. NaCl at  $p_H$  7.3. H. G. R.

**Lethal dose of toxins of some anaerobes for sheep.** J. H. MASON (Onderstepoort J. Vet. Sci., 1935, 5, 61—64).—Data are given for the toxins of *Clostridium septique*, *Cl. oedematiens*, *Cl. ovitoxicus*, and *Cl. welchii*, in respect of mice and sheep.

CH. ABS. (p)

(A) Serologic agglutination of the obligate anaerobes, *Clostridium paraputrificum* (Biestock) and *C. capitolis* (Snyder and Hall).

(B) Mechanism of the non-specific serum agglutination of these anaerobes. M. L. SNYDER (J. Bact., 1936, 32, 401—410, 411—422).—(A) The two organisms are serologically distinct. Non-sp. acid agglutinations occurred when glucose (I) broth cultures having terminal  $p_H < 5.0$  were used.

(B) Non-sp. serum agglutination of (I) broth cultures of *C. paraputrificum* results from the action of acid produced by fermentation of (I) flocculating a substance in the broth which in turn entrained the bacteria. Agglutination of broth cultures in presence of  $H_2SO_4$  (1:10) occurs at 5.1 and in aq. suspensions at 3.01—3.02. Non-sp. reactions are avoided by use of neutral broth or of physiological saline suspensions. A. G. P.

**Metabolism of various types of sugars by *S* and *R* forms of pneumococcus.** P. FINKLE (J. Bact., 1936, 32, 473—483).—Respiratory oxidation of fructose (I) by *S* forms was  $>$  that of other sugars examined. Conversion of virulent into non-virulent types is associated with diminution in rate of oxidation of (I). In *R* III forms sugar oxidation was most rapid in the case of maltose. Rates of glycolysis of (I) by types I and II was  $>$  that by III. Glucose was the most easily glycolysed sugar in the case of types III and *R* II, and (I) in the case of *R* I and *R* III. A. G. P.

***Streptococcus cremoris*.** E. S. YAWGER and J. M. SHERMAN (J. Dairy Sci., 1937, 20, 205—212).—*S. cremoris* can be differentiated from *S. lactis* by the inability of the former either to produce  $NH_3$  in 4% peptone, or to grow in the presence of 4% NaCl at 40° or in broth at  $p_H$  9.2. It is also less tolerant to 0.3% methylene-blue than *S. lactis*. Other characteristics are also given. W. L. D.

**Identification of streptococcus of mastitis in milk.** W. L. WILLIAMS (Amer. J. Publ. Health, 1937, 27, 453).—About 90% of streptococcus strains causing bovine mastitis are *S. agalactiae*. The main cultural characteristics are: hæmolysis on blood

agar, acidity and bleaching from the bottom in litmus milk, no effect on aesculin, hydrolysis of Na hippurate, and rough growth in broth. W. L. D.

**Growth and fermentation of bacteria near their minimum temperature.** M. J. FOTER and O. RAHN (J. Bact., 1936, 32, 485—497).—In milk heavily infected with streptococci lactic fermentation occurs at 0° although at reduced rates. The diminution in rate of this fermentation is most marked in the species which do not grow at 0°. Among such species *S. lactis* shows decreasing enzyme activity during storage (4—8 weeks) and regains normal fermentative capacity only after a no. of generations have been grown. *S. faecalis*, which multiplies at 0°, is not thus affected. Acid production was lowest at 0° with all species and increased with rising temp. Differences between species in this respect are not wholly attributable to deterioration of enzymes. Lactose consumption per unit cell increase varies considerably with the species, is const. for individual species at low and medium temp., and increases as optimum temp. is approached. A. G. P.

**Dynamics of fibrinolysin production by streptococci.** R. R. MADISON and J. D. TARANIK (Proc. Soc. Exp. Biol. Med., 1937, 36, 1—3).—Routine clinical tests of broth cultures of *S. hæmolyticus* older than 12 hr. lead to erroneous conclusions as to their fibrinolysin content. P. G. M.

**Nutrition of *Staphylococcus aureus*.** Nicotinic acid and vitamin- $B_1$ . B. C. J. G. KNIGHT (Biochem. J., 1937, 31, 731—737).—*S. aureus* can be grown aerobically on a medium containing  $NH_2$ -acids and glucose together with a supplement (yeast concentrate or the high-vac. distillate derived from it) which is replaceable by nicotinic acid (I) + vitamin- $B_1$ . Neither (I) nor  $-B_1$  alone is effective in rendering growth possible. Evidence is given that (I) is present in most active preps. of *S. aureus* growth factor. P. W. C.

**Absorption of staphylococcus bacteriophages.** M. L. RAKIETEN, T. L. RAKIETEN, and S. DOFF (J. Bact., 1936, 32, 505—518).—Susceptible cultures of staphylococci furnish extracts which inhibit bacteriophage. The susceptibility of the culture to the phage is related to the ability of an extract of the culture to inactivate bacteriophage. Extracts are heat-stable but lose ability to inactivate phage on filtration through bacterial filters and on pptn. by homologous anti-sera. Heat-killed or autoclaved cultures of susceptible organisms absorb phage. A. G. P.

**Chemiluminescence.** J. G. EYMERS (Chem. Weekblad, 1937, 34, 312—314).—Previous work on chemiluminescence in gas and liquid phases and on bioluminescence is reviewed. The light emitted in various bioluminescent phenomena is very similar. In the oxidation of luciferin by  $O_2$  in presence of luciferase by light bacteria, two broad absorption bands symmetrically disposed about  $\nu = 18,200$  and  $20,300 \text{ cm}^{-1}$ , respectively, are observed, whilst the fluorescence spectrum of lactoflavin shows a single broad band at  $\nu = 18,200 \text{ cm}^{-1}$ . Oxidation of dimethylacridinium nitrate also gives bands at

$\nu = 18,200$  and  $20,250 \text{ cm}^{-1}$  and 3-aminophthalhydrazide at  $\nu = 20,300$  and  $21,250 \text{ cm}^{-1}$ . The fluorescence spectra of the culture medium in which *B. pseudomonas putida* has been grown and of extracts of luciferin and luciferase from *Cypridina* also show the band at  $\nu = 18,200 \text{ cm}^{-1}$  with bands at  $20,800$  and  $21,200 \text{ cm}^{-1}$ , respectively. S. C.

**Influence of salts on light emission of marine bacteria.** F. BUKATSCH (Chem.-Ztg., 1937, 61, 309).—Glutamic acid (I), alanine, and leucine (0.01–0.05%) provided favourable sources of N for the development of luminous bacteria (cf. Mudrak, A., 1933, 1334). With (I) Na salts are essential in the culture media and K also appeared to be necessary. Sulphates of Cu, Zn, Fe, and Mn (0.01–0.0001%) stimulated light evolution from the cells without increasing their no., but when  $\text{CaCl}_2$  was also added development took place. Ca may retard the entry of poisonous Cu etc. into the protoplasm. Sr and Ba were less effective. S. M.

**Determination of indole in bacterial cultures.** E. MACCHIA (Diagnostica tec. lab. Napoli, 1935, 6, 752–757).—The washed  $\text{Et}_2\text{O}$  extract of the culture is treated with AcOH, a 1% solution of *p*- $\text{NMe}_2\text{-C}_6\text{H}_4\text{-CHO}$  in EtOH, and sulphosalicylic acid (20%). On evaporation of the  $\text{Et}_2\text{O}$  a reddish-violet colour indicates indole and a blue colour skatole. The colours are compared with standards. CH. ABS. (p)

**Re-development of colour in leuco-derivatives by nitrates in presence of bacteria.** E. AUBEL, O. SCHWARZKOPF, and GLASER (Compt. rend. Soc. Biol., 1937, 125, 223–224).—If reduction of the  $\text{NO}_3^-$  is inhibited by KCN etc., only a slight development of colour is observed. H. G. R.

**Formation of organo-metalloidal and similar compounds by micro-organisms. V. Methylated alkyl sulphides. Fission of the disulphide link.**—See A., II, 271.

**Metabolism of the filter-passing organism C from sewage.** A. PRIE (Brit. J. Exp. Path., 1937, 18, 96–102).—Blood assists only aerobic growth of the organism. Under aerobic conditions  $\text{NH}_3$ ,  $\text{NH}_4\text{-N}$ , and reducing sugar in the medium are unaltered but added glucose (I) is utilised to varying extents according to the amount of blood present. Anaerobically, with or without blood,  $\text{NH}_4\text{-N}$  and (I) are unaltered but  $\text{NH}_3$  increases. Dehydrogenase vals. for isolated organism on various substrates are tabulated. Hæmin is necessary for the oxidation of (I) but does not affect respiration in (I)-free peptone. Hæmin is rapidly destroyed. 3–4 O are consumed per mol. of (I) metabolised.  $\text{CN}^-$  inhibits, but flavin, flavoprotein, and cytochrome-C do not influence, respiration. Organisms grown anaerobically show extra O uptake on entering aerobiosis.

R. M. M. O.

**Metabolism of filter-passing organism A from sewage.** B. HOLMES (Brit. J. Exp. Path., 1937, 18, 103–107).—Methylene-blue is reduced as rapidly with lactate as with glucose (I). The organism can grow on peptone (II) alone but growth is assisted by blood both aerobically and anaerobically.

Oxidisable substances in (II) are gradually used up. Disappearance of (I) cannot be demonstrated.  $\text{NH}_3$  is never produced. R. M. M. O.

**Centrifugation studies. III. Viruses of foot-and-mouth disease and vesicular stomatitis.** W. J. ELFORD and I. A. GALLOWAY (Brit. J. Exp. Path., 1937, 18, 155–161).—Sedimentation rates indicate a diameter about 70 for the vesicular stomatitis virus, in agreement with ultrafiltration observations. The val. obtained for foot-and-mouth virus is 20  $\mu$ , nearly twice the ultrafiltration val. The larger size is probably more correct. The particles of each virus are probably uniform in size.

R. M. M. O.

**Measurement of the size of viruses by high-speed centrifugalisation.** J. MCINTOSH and F. R. SELBIE (Brit. J. Exp. Path., 1937, 18, 162–174).—Details of an air-driven centrifuge are given. When the final concn. of organisms in the supernatant fluid is plotted as a power of 10 against time of spinning, a straight line is obtained the angle made by which with the horizontal (sedimentation angle) can be used to characterise the organism. Vals. thus obtained are > those previously determined by filtration methods. The  $d$  of particles is determined by sedimenting in various fluids. R. M. M. O.

**Air-borne plant virus.** (A) J. CALDWELL. (B) K. M. SMITH (Nature, 1937, 139, 761, 761–762).—A criticism (cf. this vol., 227) and a reply.

L. S. T.

**Structure types of protein "crystals" from virus-infected plants.** J. D. BERNAL and I. FAN-KUCHEN (Nature, 1937, 139, 923–924; cf. this vol., 71).—Diagrams indicating the structure of the so-called cryst. virus protein prepared by the method of Stanley and Wyckoff are reproduced. The long mols. of the protein are packed with a perfect hexagonal two-dimensional regularity at right angles to their length, but there is no regularity of mol. arrangement in the direction of their length. The mol. is made up of piles of sub-mols.  $22 \times 20 \times 20 \text{ \AA}$ , somewhat smaller than the normal protein mol., and themselves divided into nearly identical groups with half these dimensions. Relative intensities of intermol. reflexions from various tobacco and cucumber viruses are given, and indicate the possibility of a system of classification of viruses on the basis of their X-ray patterns.

L. S. T.

**Acquired immunity against the "Y" potato virus.** R. N. SALAMAN (Nature, 1937, 139, 924–925).—The prep. of an attenuated form of virus which affords complete protection to tobacco plants and partial protection to potato plants is described.

L. S. T.

**Bunchy-top disease of tomato.** A. P. D. MCCLEAN (Union S. Africa Dept. Agric. Sci. Bull., 1935, No. 139, 46 pp.).—In aq. extracts the virus was killed by heating at  $>70^\circ$  for 10 min. 30% EtOH did not cause appreciable loss of infectivity in 1 hr. Higher concns. were injurious.

CH. ABS. (p)

**Preparation of virus-proteins by ultracentrifuging.** R. W. G. WYCKOFF (Compt. rend. Soc. Biol., 1937, 125, 5–7).—The protein of tobacco mosaic

disease, cryst. by means of the ultracentrifuge, has a mol. wt.  $\sim 17 \times 10^6$ . That of infectious papilloma of rabbits has a slightly greater mol. wt. and is present in infected tissue at a concn. of 0.05%. H. G. R.

**Toxoplasma and obligate intracellular parasitism.** A. B. SABIN and P. K. OLITSKY (Science, 1937, 85, 336—338).—Results obtained with toxoplasma, the causative agents of various pathological conditions in birds and mammals, are summarised. As a result of their apparent obligate intracellular parasitism, these parasites have many features in common with certain ultra-microscopic viruses.

L. S. T.

**Sonic energy as a lethal agent for yeast and bacteria.** T. D. BECKWITH and C. E. WEAVER (J. Bact., 1936, 32, 361—373).—Supersonic treatment (quartz crystal) killed certain yeasts and bacteria, diminished the no. of viable spores in suspensions, but had no influence on agglutinin or bacteriophage. Germicidal action is prevented by protein but not by lipin solutions.

A. G. P.

**Action of wine on pathological organisms of man.** W. DIETZE (Zentr. Bakt. Par., 1936, II, 93, 252—264).—The bactericidal activity of white was > that of red wines. It is attributable to the joint action of EtOH and acids.

A. G. P.

**Bactericidal and photochemical properties of irradiated cod-liver oil and an ozonide of olive oil.** F. A. STEVENS (J. Bact., 1936, 32, 47—55).—Fogging of photographic plates and the bactericidal effects of irradiated cod-liver oil and the ozonide of olive oil are due to substances liberating active  $O_2$ . Sublethal doses of the active  $O_2$  from these oils retard growth of bacteria or may cause dissociation.

A. G. P.

**Bactericidal and photochemical properties of irradiated petrolatum and mineral oil.** F. A. STEVENS (J. Lab. Clin. Med., 1935, 21, 26—30).—The activity is due to peroxides and aldehydes.

CH. ABS. (*r*)

**Bactericidal properties of acraldehyde.** R. E. VOLLRATH, L. WALTON, and C. C. LINDEGREN (Proc. Soc. Exp. Biol. Med., 1937, 36, 55—58).—The bactericidal properties of garlic towards *B. coli* and *B. subtilis* are due to the presence of acraldehyde and not to the sulphides.

P. G. M.

**Cold sterilisation of nutrient media and its importance for the pure culture of micro-organisms.** G. SCHWEIZER (Arch. Mikrobiol., 1936, 7, 297—314).—Apparatus for cold vac. sterilisation is described and various sterilising agents are examined.

A. G. P.

**Testing bacteria-proof filters.** B. V. JILLINGS (Pharm. J., 1937, 138, 553).—The filtrate passing a candle etc. drops into a sterile bottle containing a nutrient agar medium. Any leak is then detected on incubating.

P. W. C.

**Effect of adrenaline on glucose excretion in fasted depancreatized dogs.** W. H. BACHRACH, W. B. BRADLEY, and A. C. IVY (Amer. J. Physiol., 1936, 117, 203—205).—The increase in glucose (I) excretion is never > the total possible amount of (I) that can be derived from muscle-glycogen (II), pro-

T (A., III.)

teins, and glycerol, and in most cases can be accounted for by (II) alone.

R. N. C.

**Separation of adrenaline from solution or from adrenal glands by electrophoresis.** N. I. GAVRILOV and A. M. KRASILNIKOV (Sci. Rep. Moscow State Univ., 1934, No. 3, 273—275).—Adrenaline is deposited at the cathode in the electrophoresis of its solutions, or of suspensions of adrenal gland in aq. AcOH, using a current of 0.002 m.amp. per sq. cm. Deposition does not take place when the glands are not absolutely fresh.

R. T.

**Adrenal cortex hormone, ascorbic acid, and amino-acids in experimental hyperthyroidism.** C. OEHME (Arch. exp. Path. Pharm., 1937, 184, 558—572).—Adrenal cortex hormone (cortidyn) decreases the increased metabolism in guinea-pigs due to thyroxine (I), decreases the loss of liver-glycogen and prolongs the life of guinea-pigs and mice in chronic (I) poisoning. Ascorbic acid (20—30 mg.) and glycine (10 mg. per 100 g.) have a similar but quantitatively different effect on the increased metabolism of hyperthyroidism. Prolonged administration of glycine and alanine decreases the normal metabolism by 10—20% in guinea-pigs, rats, and rabbits. The duration of life in hyperthyroidism is not changed by alanine, glucose, or NaI.

P. W. C.

**Behaviour of the adrenals in experimental hyperthyroidism.** E. KADEN, C. OEHME, and K. WEBER (Arch. exp. Path. Pharm., 1937, 184, 573—579).—The hypertrophy of the adrenals on repeated injection of thyroxine can be brought about by quite small doses ( $0.5 \times 10^{-6}$  g. per 100 g.) and the effect cannot be due to the action on total metabolism. Cortidyn inhibits or decreases the increase of the adrenals. The effect is connected in some way with the pituitary.

P. W. C.

**Blood-sugar of the adrenalectomised dog.** W. M. PARKINS, H. W. HAYS, and W. W. SWINGLE (Amer. J. Physiol., 1936, 117, 13—23).—Blood-sugar (I) in the healthy adrenalectomised dog from which cortical hormone (II) has been withheld shows no significant deviation from the normal, but shows sharp and variable falls in traumatised or single-stage-adrenalectomised animals when in collapse; adrenaline restores (I) to normal or > normal without affecting the shock symptoms. Large amounts of (II) do not affect (I) in any of the above types of animal. Intraperitoneal injections of isotonic glucose induce shock and collapse, followed by death with (I) > normal unless (II) is given. The adrenalectomised bitch in oestrus (pseudopregnancy) is maintained in normal health for 40—60 days without (II), during which time (I) is generally > normal. (II) *per se* is apparently not concerned in carbohydrate metabolism in so far as this is reflected by (I). Hypoglycaemia has no significance in adrenal insufficiency in the dog.

R. N. C.

**Partial synthesis of a crystallised compound with the biological activity of the adrenal-cortical hormone.** M. STEIGER and T. REICHSTEIN (Nature, 1937, 139, 925—926; cf. A., 1937, II, 105).—21-Hydroxyprogesterone (I), m.p. 136—138°, prepared from stigmasterol, has a definite cortical activity on

adrenalectomised dogs and rats, and is the first such substance to be prepared from inactive material. (I) probably differs from corticosterone only by the absence of the fourth O. L. S. T.

**Bio-assay of adrenal cortical extract: direct comparison of rat and dog units.** G. F. CARTLAND and M. H. KUIZENGA (*Amer. J. Physiol.*, 1936, 117, 678—685). R. N. C.

**Carbon monoxide and the anterior lobes of the pituitary.** F. KAMPELMANN and E. SCHULZE (*Arch. exp. Path. Pharm.*, 1937, 184, 152—155).—CO activates guinea-pig thyroid and decreases the thyrotropic hormone content of the anterior lobes of the pituitary. P. W. C.

**Antiluteogenic factor in the anterior pituitary.** J. FREUD (*Nature*, 1937, 139, 880—881).—Experimental evidence for such a factor is presented. L. S. T.

**Gonadotropic hormone of the anterior pituitary gland and creatinuria.** I. I. NITZESCU and I. GONTZEA (*Compt. rend. Soc. Biol.*, 1937, 125, 80—81).—Injection of prolan decreases the excretion of creatine and creatinine and also increases the tolerance to exogenous creatine. H. G. R.

**Adrenotropic principle of the pituitary in relation to lactation.** E. T. GOMEZ and C. W. TURNER (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 78—80).—Cessation of lactation following hypophysectomy in the guinea-pig is probably due to withdrawal of lactogenic, adrenotropic, and carbohydrate metabolism hormones. P. G. M.

**Effect of thyroxine and galactin on lactation in hypophysectomised guinea-pigs.** E. T. GOMEZ and C. W. TURNER (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 80—81).—Neither Na thyroxine nor galactin, separately or in conjunction, can resuscitate milk secretion in hypophysectomised guinea-pigs.

**Inhibition of the gonadotropic activity of the human pituitary by antiserum.** I. W. ROWLANDS and A. S. PARKES (*Lancet*, 1937, 232, 924—926).—Prolonged treatment of a goat with pregnyl, a pregnancy urine extract, resulted in its serum being able to neutralise in rats and rabbits the effect of the original antigenic extract and the gonadotropic activity of human anterior pituitary. L. S. T.

**Augmentation of the gonad-stimulating action of pituitary extracts by inorganic substances, particularly copper salts.** H. L. FEVOLD, F. L. HISAW, and R. GREIF (*Amer. J. Physiol.*, 1936, 117, 68—74).—Cu<sup>++</sup>, Zn<sup>++</sup>, yeast extract (I), and yeast ash augment the action of follicle-stimulating hormone (II), with or without luteinising hormone (III), on the ovaries of immature rats. Zn<sup>++</sup> augments the action of (II), or (II) and (III), in hypophysectomised rats, but Cu<sup>++</sup> is without effect if (III) is absent. (I) and Cu<sup>++</sup> cause ovulation in mature rabbits, but Zn<sup>++</sup> has no effect. Zn<sup>++</sup> probably decreases the rate of absorption of active material; Cu<sup>++</sup> may catalyse the synergistic interaction of (II) and (III) in ovarian development. R. N. C.

**Rationalisation of the method of biological assay for the corpus luteum hormone.** J. T.

CHRISTENSEN (*Quart. J. Pharm.*, 1937, 10, 52—58).—Young rabbits are used with a modification of Clauberg's method (A., 1932, 656), the potency of a dose being related to the no. of animals in a group which show a response > a given submax. standard.

R. M. M. O.

**Action of corpus luteum hormone on the human menstrual cycle.** T. N. MORGAN and S. G. DAVIDSON (*Lancet*, 1937, 232, 861—864).—Excision of the corpus luteum is followed within 48 hr. by menstruation. Injection of proluton, a substance having the action of the corpus luteum hormone, before and after excision may cause delay in the onset of menstruation, which is not delayed, however, in normal women. The onset of normal menstruation may not be determined solely by degeneration of the corpus luteum. L. S. T.

**Ovarian hormone threshold for experimental menstruation in monkeys.** E. ALLEN, A. W. DIDDLE, T. H. BURFORD, and W. M. GARDNER (*Amer. J. Physiol.*, 1936, 117, 381—392). R. N. C.

β-Estradiol.—See A., II, 289.

**Action of testosterone propionate on normal adult female rats.** V. KORENCHESKY, M. DENNISON, and K. HALL (*Biochem. J.*, 1937, 31, 780—785; cf. A., 1936, 644).—Prolonged injections of large doses of testosterone propionate into adult female rats suppressed the appearance of normal oestrus, and had a powerful stimulating effect on the uterus, vagina, and preputial glands and, to a smaller extent, on the mammary gland. The histological changes resemble those during pregnancy. A considerable increase in the rate of involution of the thymus, slight increase in wt. of the kidneys, and decrease of fat deposition also occur. The sexual hormones are classified into three groups on the basis of their male and female sexual activities. P. W. C.

**Antagonism between testosterone and folliculin.** P. GLEY and J. DELOR (*Compt. rend. Soc. Biol.*, 1937, 125, 52—54).—Testosterone inhibits the action of the gonadotropic hormone on the immature ovary and so prevents secretion of folliculin.

H. G. R.

**Relationship of the synthetic male hormone, androstenedione, to the protein and energy metabolism of castrate dogs, and the protein metabolism of a normal dog.** C. D. KOCHAKIAN and J. R. MURLIN (*Amer. J. Physiol.*, 1936, 117, 642—657).—Protein metabolism in castrate male dogs is decreased by injection of androstenedione (I), N retention being borne by urinary urea. The daily max. N retention and the amount of hormone necessary to cause this effect α body-wt., and are the same for urinary male hormone and (I). Non-protein- and urea-N in the blood may fall, but never rise. Energy metabolism is not affected, nor is protein metabolism in normal animals. R. N. C.

**Action of insulin on gastric secretion in normal and diabetic men.** G. LOLLÍ (*Boll. Soc. ital. Biol. sperim.*, 1937, 12, 45).—Insulin (I) stimulates gastric secretion in normal and hyperchlorhydric men but not in diabetics, in one of whom a blood-sugar level of 0.06% contra-indicated the view that (I) causes

gastric hypersecretion by the hypoglycæmia produced. Ingestion of soup, however, stimulates the secretion in diabetics. F. O. H.

**Action of insulin on muscle-glycogenolysis in the dog.** M. POLONOVSKI, G. BIZARD, and H. WARRENBURG (Compt. rend., 1937, 204, 1090—1092).—Using the hind limb of a dog with only the sciatic nerve and the femoral vein and artery intact, total interruption of the blood supply led to hypoglycæmia. Injection of insulin (I) into the femoral artery led after 15 min. to a hyperglycæmia which after 45 min. was replaced by a hypoglycæmia > that without (I). When NaF was introduced before (I), the hyperglycæmia was maintained after 15 min. and was even greater if PO<sub>4</sub>''' buffer of  $p_H$  7.32 was administered with the NaF. P. W. C.

**Effect of intravenous administration of protamine-insulin.** B. B. LONGWELL and A. RAVIN (Amer. J. Physiol., 1936, 117, 453—456).—The action differs little from that of regular insulin. The prolonged effect after subcutaneous injection is confirmed. R. N. C.

**Modification in the action of insulin by the addition of a colloidal suspension (gelatin).** D. BROWN (Compt. rend., 1937, 204, 1015—1016).—The hypoglycæmic effect of insulin is intensified and the period occupied in restoring the blood-sugar to the original level is much increased by administration in 1% aq. gelatin. J. L. D.

**Histone combinations of the protein hormones.** F. BISCHOFF (Amer. J. Physiol., 1936, 117, 182—187).—Thymus histone (I) ppts. insulin (II) on the alkaline side of the isoelectric point of (II). The complex is approx. of the same potency as the original (II) when given intravenously, but relatively less potent when given intramuscularly. In larger doses it causes prolonged hypoglycæmia without shock. (I) ppts. relatively inactive material from prolactin or pituitary gonadotropic preps. (III) at  $p_H$  6.0—8.0, leaving an active filtrate. When assayed in the conventional manner, (I) produces a decrease in the activity of (III) by combining with the (III)-adsorbing proteins; addition of Zn<sup>++</sup> prevents this action. R. N. C.

**Simon's method for determination of the hypercalcaemic action of parathyroid hormone.** E. CUBONI (Boll. Soc. ital. Biol. sperim., 1936, 11, 1019—1021).—Simon's method (A., 1935, 539) can be used with rats as test animals. F. O. H.

**Role of the thyroid in the calorogenic action of vitamin-D.** H. DEUTSCH, C. I. REED, and H. C. STRUCK (Amer. J. Physiol., 1936, 117, 1—5).—Complete thyroparathyroidectomy in dogs causes a decrease in metabolic rate correlated with loss of wt., both recovering simultaneously. Large doses of vitamin-D do not increase the metabolic rate as in normal dogs. The effect of -D is not due to an action on the parathyroids. R. N. C.

**Mutual action of dinitrophenol-thyroxine and methylene blue-thyroxine in the isolated perfused dog's leg.** N. ALWALL and I. SCHEFF-PFEIFER (Arch. exp. Path. Pharm., 1937, 184, 296—

304).—Whereas addition of thyroxine to the blood perfusing the isolated dog's hind leg causes increased oxidation but does not increase the action of dinitrophenol (I), it causes in isolated limbs of animals fed on thyroid an increase of the oxidation effect of both (I) and of methylene-blue (II). The effect in the latter case is thus the same as in the intact animal. The mechanisms of the actions of (I) and (II) are probably the same. P. W. C.

**Action of arsenious acid on the thyroid and anterior lobes of the pituitary.** F. KAMPELMANN (Arch. exp. Path. Pharm., 1937, 184, 139—151).—After administration of small amounts of As<sub>2</sub>O<sub>3</sub> to rats for 20 days, inhibition of the thyroid could be detected histologically, due probably to decreased production of the thyrotropic hormone of the anterior lobes of the pituitary. P. W. C.

**Effect of experimental hyperthyroidism on carbohydrate metabolism.** I. A. MIRSKY and R. H. BROH-KAHN (Amer. J. Physiol., 1936, 117, 6—12).—Thyroid fed to rabbits increases utilisation of carbohydrate by the extrahepatic tissues. This is not due to defects in the glycogenic or glycolytic mechanism of the liver, since it occurs in eviscerated animals. The similarity between the syndromes of hyperthyroidism and diabetes may be due to the accelerated glycogenolysis that is common to both conditions. R. N. C.

**Blood-protein, -lipin, and -cholesterol and protein:lipin ratio in the hyperthyroxinised animal.** C. I. PARHON and I. ORNSTEIN (Bull. Soc. Chim. biol., 1937, 19, 508—510).—There is a slight increase in the lipin, fatty acid, cholesterol, and protein contents of blood, and a slight increase in the protein:lipin ratio, in hyperthyroxinised dogs. E. A. H. R.

**Relation of pancreatic juice to the fatty infiltration and degeneration of the liver in the depancreatized dog.** J. VAN PROHASKA, L. R. DRAGSTEDT, and H. P. HARMS (Amer. J. Physiol., 1936, 117, 166—174).—Withdrawal of pancreatic juice from the intestines of dogs does not cause fatty degeneration and infiltration of the liver. Oral administration of fresh pancreatic juice does not have the beneficial effect resulting from raw pancreas feeding. Hence the effect is not due to the pancreatic enzymes; the substance responsible is not choline or lecithin, but a sp. substance of the pancreas. R. N. C.

**Substance in pancreas (fat-metabolising hormone) which permits survival and prevents liver changes in depancreatized dogs.** L. R. DRAGSTEDT, J. VAN PROHASKA, and H. P. HARMS (Amer. J. Physiol., 1936, 117, 175—181).—EtOH extracts of ox pancreas contain a sp. substance that prevents fatty degeneration and infiltration of the livers of depancreatized-insulinised dogs when given orally. The name *lipocaic* is suggested for the active substance, which is sol. in H<sub>2</sub>O and 5% NaCl, but insol. in Et<sub>2</sub>O, which can be used to free it from fat. R. N. C.

**Growth hormone and creatinuria.** I. I. NITZESCU and I. GONTZEA (Compt. rend. Soc. Biol.,

1937, 125, 291—293).—Creatinuria occurring before puberty is attributed to the presence of the growth hormone.  
H. G. R.

**Thymus and pineal glands.** L. G. ROWNTREE, J. H. CLARK, A. STEINBERG, A. M. HANSON, N. H. EINHORN, and W. A. SHANNON (Ann. Intern. Med., 1935, 9, 359—375).—Thymus extract increased the growth rate and development and hastened the onset of adolescence in the offspring of treated rats. Thymusectomy of parent rats retarded the growth of the young. Pineal extract retarded growth and accelerated the onset of adolescence.

CH. ABS. (p)

**Vitamins in ophthalmology.** E. BARONI (Österr. Chem.-Ztg., 1937, 40, 249—252).—A review.

E. S. H.

**Technology of vitamins.** A. A. SCHMIDT (Bull. Acad. Sci. U.R.S.S., 1936, 929—933).—A lecture.

R. T.

**Position of the vitamins in the series of food constituents.** L. K. WOLFF (Chem. Weekblad., 1937, 34, 314—317).—A review of the chemical constitutions and the physiological actions of vitamin-A, -B<sub>1</sub>, -B<sub>2</sub>, -C, -D, -D<sub>2</sub>, -E, and -P.  
S. C.

**Structure of vitamin-A, -B<sub>1</sub>, and -B<sub>2</sub>.** K. G. PACKENDORF (Bull. Acad. Sci. U.R.S.S., 1936, 901—909).—A review.  
R. T.

**Production of aqueous solutions of fat-soluble vitamins.** G. LORENZINI (Arch. Ist. Biochim. Ital., 1937, 9, 3—18).—The conc. vitamin-A or -D prep. is dissolved in an EtOH solution of bile acids, aq. Na salt of a bile acid is added, and the mixture diluted with H<sub>2</sub>O to give a clear, stable solution. Such preps. cannot be assayed by the SbCl<sub>5</sub> method.

F. O. H.

**Changes in the vaginal epithelium of the rat on an excessive vitamin-A diet.** T. C. SHERWOOD, M. A. BREND, and E. A. ROPER (J. Nutrition, 1936, 11, 593—597).—Administration of large amounts of carotene to rats prevented a normal vaginal smear picture and produced a rapid growth of the epithelium.  
A. G. P.

**Lesions of the nervous system in vitamin deficiency. IV. Effect of carotene in the treatment of nervous disorder in rats fed a diet low in vitamin-A.** H. M. ZIMMERMAN and G. K. COWGILL (J. Nutrition, 1936, 11, 411—423).—Carotene (I) when administered early but not when late in the course of vitamin-A deficiency corrects all but the neurologic disorders associated therewith. Substitution of (I) for -A throughout the experimental period caused no deficiency symptoms. Nervous derangement of rats receiving an -A-deficient diet is due to lack of -A and not to that of unsaturated fatty acids.  
A. G. P.

**Carotene and associated pigments in medullated nerve.** J. P. BARTZ and F. O. SCHMITT (Amer. J. Physiol., 1936, 117, 280—284).—Carotene (I) and vitamin-A in the peripheral nerves of frogs fall during fasting, disappearing completely in 3 or 4 weeks according to the temp. Daily feeding of (I) induces storage in the nerves within a week, considerable

conversion to -A taking place if xanthophyll is also supplied.  
R. N. C.

**Determination of vitamin-A.** W. J. NIJVELD (Chem. Weekblad, 1937, 34, 379—384).—Various methods are examined. The most trustworthy is the Carr-Price method provided that the colour is measured spectrophotometrically. The Rosenthal method (A., 1935, 792) does not give satisfactory results.  
S. C.

**Synthesis of vitamin-A.**—See A., II, 288.

**Synergism of vitamins. I. Influence of varying intake of vitamin-A on vitamin-B<sub>1</sub> requirements.** A. SCHEUNERT and S. RAU (Z. physiol. Chem., 1937, 246, 267—271).—The administration of large doses of vitamin-A (with some -D) does not affect the -B<sub>1</sub> requirements of growing rats.  
F. O. H.

**Comparison of methods for extraction of vitamin-B<sub>1</sub> from international standard acid clay.** W. L. SAMPSON and J. C. KERESZTESY (Proc. Soc. Exp. Biol. Med., 1937, 36, 30—32).—The quinine sulphate method yields twice the amount obtained by alkali-extraction.  
P. G. M.

**Vitamins in human nutrition. Vitamin-B<sub>1</sub>, and the "brown versus white bread problem."** I. L. J. HARRIS. II. P. C. LEONG and L. J. HARRIS (Biochem. J., 1937, 31, 799—811, 812—816).—I. Owing to refection (cf. Roscoe, A., 1932, 200), the vitamin-B<sub>1</sub> contents of white and brown breads cannot be compared by rat growth methods. Using the bradycardia method, it was shown that "germ bread" and wholemeal bread are both 7—8 times as potent as white bread and that "bran bread" is not very inferior to "germ bread."

II. "Germ flour" is similar in activity to wholemeal flour. White flour is an inadequate source of -B<sub>1</sub>. -B<sub>1</sub> contents of bran, middlings, and wheat germ are also determined.  
E. A. H. R.

**Hydrogen sulphite-binding substance in human blood in beriberi.** T. SHINDO (Z. physiol. Chem., 1937, 247, III).—The blood of persons suffering from beriberi has a high content of a substance (MeCHO?: isolated as 2:4-dinitrophenylhydrazone) which combines with NaHSO<sub>3</sub>. The content is restored to the normal level by administration of aneurin.  
W. McC.

**In vitro action of crystalline vitamin-B<sub>1</sub> on pyruvic acid metabolism in tissues from polynuritic chicks.** W. C. SHERMAN and C. A. ELVEHJEM (Amer. J. Physiol., 1936, 117, 142—150).—The O<sub>2</sub> uptake in presence of pyruvate (I) of brain or kidney tissue from vitamin-B<sub>1</sub>-deficient chicks is < normal, whilst their ability to utilise (I) is impaired. Addition of small quantities of -B<sub>1</sub> increases respiration to almost normal vals., the increase being accompanied by an increase in the amount of (I) removed.  
R. N. C.

**Anaerobic glycolysis in tissues from polynuritic chicks: negative action of vitamin-B<sub>1</sub>.** W. C. SHERMAN and C. A. ELVEHJEM (Amer. J. Physiol., 1936, 117, 151—154).—Tissues from vitamin-B<sub>1</sub>-deficient chicks readily break down glucose

and glycogen to lactic acid under anaerobic conditions. Pyruvic acid does not accumulate. Added  $-B_1$  does not affect glycolysis. R. N. C.

**Catatorulin effect.** H. G. K. WESTENBRINK and J. J. POLAK (Rec. trav. chim., 1937, 56, 315—329).—The  $O_2$  uptake of brain tissue of pigeons in avitaminosis- $B_1$ , when suspended in Ringer- $PO_4^{'''}$ -pyruvate (I) solution, is increased by adding vitamin- $B_1$  *in vitro*. The max. effect was obtained when  $-B_1$  was added before beginning the respiration experiment, the reaction having an induction period of about 10 min. No such period was observed when (I) was added to a tissue suspension which contained  $-B_1$ . The view is adopted that the  $O_2$  uptake of avitaminotic brain in presence of (I) is not catalysed by free  $-B_1$  but by a compound of  $B_1$  with an unknown labile substance (cf. Gavrilescu and Peters, A., 1932, 200). P. W. C.

**Determination of vitamin- $B_1$  (aneurin).** W. KARRER and U. KUBLI (Helv. Chim. Acta, 1937, 20, 369—373).—Jansen's method (A., 1936, 1566) is modified by oxidising the substance or solution containing vitamin- $B_1$  with alkaline  $K_3Fe(CN)_6$ , transference of the tniochrome (I) thus produced to Bu-OH, and direct comparison of the intensity of the violet fluorescence excited by ultra-violet light with that given by solutions containing known amounts of  $-B_1$  or (I). H. W.

**Synthesis of aneurin.**—See A., II, 307.

**Water-soluble B-vitamins. VII. Growth-promoting properties of lactoflavin.** C. E. EDGAR, T. F. MACRAE, and F. VIVANCO. **VIII. Essential dietary factors for the rat present in autoclaved yeast extracts in addition to lactoflavin.** **IX. Properties of the dietary factor in the fuller's earth filtrate from autoclaved yeast extracts.** C. E. EDGAR and T. F. MACRAE (Biochem. J., 1937, 31, 879—885, 886—892, 893—902).—**VII.** When  $-B_1$  is supplemented by no component of the  $-B_2$  complex except lactoflavin, young rats maintain low subnormal growth which is increased by a heat-stable factor (I) present in the filtrate from autoclaved yeast extracts treated with fuller's earth or in EtOH extract of wheat germ. The extent of the increase is parallel to the lactoflavin concn. and is not dependent on the source of the supplementary material.

**VIII.** A second factor in yeast extracts, which is adsorbed on fuller's earth and eluted by 0.1N- $Ba(OH)_2$ , is essential for normal growth.  $-B_1$  is probably the only B-vitamin destroyed by autoclaving at  $p_H$  5 at 120°.

**IX.** (I) is stable in dil.  $Ba(OH)_2$  and  $H_2SO_4$  at 100°, is unaffected by light, is not adsorbed by fuller's earth or  $Al(OH)_3$ , but is adsorbed by C, from which it is eluted by aq. NaOH or AcOH. It is pptd. by  $Ba(OH)_2$  in 90% EtOH and does not migrate in electrodialysis although it readily passes through a Cellophane membrane. R. M. M. O.

**Lactoflavin, a necessary growth-promoting dietary factor.** S. ANSBACHER, G. C. SUPPLEE, and R. C. BENDER (J. Nutrition, 1936, 11, 401—409).—Growth of rats is related to the intake of lactoflavin

(I) in the range  $2-22 \times 10^{-6}$  g. daily. A biological method of assessing the growth-promoting val. of (I) is discussed. A. G. P.

**Concentration of the anti-pellagra factor.** C. J. KOEHN, jun., and C. A. ELVEHJEM (J. Biol. Chem., 1937, 118, 693—699).—The residue (400 g.) from the amyl alcohol extract (cf. A., 1935, 669) of liver, extracted with EtOH followed by COMe, and purified in aq. solution by adsorption of impurities with C, yields 2.56 g. of solid which protects dogs from black tongue in daily doses of 64 mg. The factor is not adsorbed on colloids. R. M. M. O.

**Vitamin- $B_2$  complex. I. Non-identity of rat dermatitis due to vitamin- $B_6$  deficiency and the dermatitis of human pellagra.** W. J. DANN (J. Nutrition, 1936, 11, 451—462).—Dermatitis in rats on a vitamin- $B_6$ -deficient diet occurred as extensively in the dark as in light.  $-B_6$  is not identical with the pellagra-preventing factor. Lactoflavin probably has no curative action on pellagra. A. G. P.

**Pellagra-like syndrome in chicks.** S. ANSBACHER, G. C. SUPPLEE, and R. C. BENDER (J. Nutrition, 1936, 11, 529—535).—Heated commercial casein contains a factor which accelerates the rate of growth and diminishes the incidence of the pellagra-like syndrome in chicks. Concentrates prepared from milk and from rice polishings contain a factor which prevents the onset of the syndrome. Vitamin-B and lactoflavin do not contain this factor, which is probably identical with that which prevents dermatitis in rats. A. G. P.

**Improved synthetic ration for vitamin- $B_4$  studies.** O. L. KLINE, H. R. BIRD, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1936, 11, 515—528).—A revised method is described. The ration previously described (Keenan *et al.*, A., 1934, 226) is modified by purification of the casein, inclusion of highly potent sources of the factors in the vitamin-B complex, except  $-B_4$ , and by addition of a substance, *e.g.*, dried lung tissue, which prevents lesions of the lining of the gizzard. The improved basal ration causes a nutritional paralysis which is prevented by supplements of peanuts, brain, kidney, or liver tissue. A. G. P.

**Chemistry of vitamin-C.** Reichstein's synthesis. A. E. FAVORSKI and T. I. TEMNIKOVA (Bull. Acad. Sci. U.R.S.S., 1936, 911—922).—A review. R. T.

**Antiscorbutic potency of reversibly oxidised ascorbic acid: enzyme in blood which reduces the reversibly oxidised vitamin.** J. R. ROE and G. L. BARNUM (J. Nutrition, 1936, 11, 359—369).—Reversibly oxidised ascorbic acid (I) has approx. 25% of the antiscorbutic potency (guinea-pig) of reduced (I), and is more active when administered orally than when injected subcutaneously. (I) administered in the reversibly oxidised form at the rate of 1 mg. per kg. body-wt. daily is not stored in rat tissue in either the oxidised or reduced form. The antiscorbutic effect of reversibly oxidised (I) is due to a reducing enzyme in blood. A. G. P.

**Ascorbic acid and histidase.** P. HOLTZ and G. TRIEM (Naturwiss., 1937, 25, 215).—The decomp.

of histidine by ascorbic acid in presence of  $O_2$  is analogous to its enzymic decomp. by histidase.

E. A. H. R.

**Relation of the adrenal cortex to vitamin-C.** J. E. LOCKWOOD, D. R. SWAN, and F. A. HARTMAN (Amer. J. Physiol., 1936, **117**, 553—558).—A cortical extract relatively free from vitamin-C is prepared by extracting ox cortex with EtOH, passing successively through  $Et_2O$ , 70% EtOH, and  $Et_2O$ , and filtration through Crystallite. The prep. affords protection against scurvy to a limited degree, large quantities failing to give complete protection. The active substance is therefore not -C, but a constituent of the cortex.

R. N. C.

**Formation of vitamin-C in rats with various nutritional deficiencies.** A. SCHEUNERT and M. SCHIEBLICH (Z. physiol. Chem., 1937, **246**, 272—277).—The synthesis of vitamin-C in the rat's organism is not influenced by the presence or absence of -A, -B, and/or -D, carbohydrates, or fats in the diet.

F. O. H.

**Determination of vitamin-C in the living organism.** H. ROTTER (Nature, 1937, **139**, 717).

L. S. T.

**Vitamin-C content of human milk and its variation with the diet.** I. SELLEG and C. G. KING (J. Nutrition, 1936, **11**, 599—606).—The vitamin-C content of the milk ranged from 0.012 to 0.108, averaging on adequate diets 0.06—0.08 mg. per c.c. Deficiencies were corr. by feeding orange juice. Other data favour the view that man and guinea-pigs can synthesise adequate quantities of ascorbic acid during gestation or infancy.

A. G. P.

**Effects of breed characteristics and stages of lactation on the vitamin-C content of cow's milk.** R. RASMUSSEN, N. B. GUERRANT, A. O. SHAW, R. C. WELCH, and S. I. BECHDEL (J. Nutrition, 1936, **11**, 425—432).—Differences in ascorbic acid contents of milk from individual cows of the same breed and receiving the same ration were wide and were partly due to differences in the stage of lactation. The latter is a more important factor than breed in this respect. The -C potency is high in the early and late stages of lactation and min. after approx. 2 months.

A. G. P.

**Spectrophotometric determination of ascorbic acid in tissues.** A. CHEVALLIER and Y. CHORON (Bull. Soc. Chim. biol., 1937, **19**, 511—526).—Both the spontaneous oxidation of ascorbic acid (I) and its transformation on irradiation with ultra-violet light are reversible, the absorption max. at 2650 Å., which almost completely disappears in these reactions, being restored on reduction with  $H_2S$ . The spontaneous oxidation of (I), but not its photochemical destruction, is inhibited by 0.002% of KCN. The latter process is more rapid when (I) is in EtOH solution. Based on these observations a method is given for the determination of (I) in tissues. The tissue is ground with  $Na_2SO_4$  in the presence of EtOH saturated with  $H_2S$  and containing KCN. An aliquot part of the filtrate is evaporated under  $N_2$  and taken up in 0.002% aq. KCN. The (I) content of this solution is calc. from the difference between its initial absorption curve and that after irradiation

with ultra-violet light. The method is applied to adrenal gland (dog), brain (guinea-pig), and liver (rat, guinea-pig) with an accuracy of 5%. 0.01 mg. of (I) can be determined in this way.

E. A. H. R.

**Vitamin-C in the brain and liver of the guinea-pig.** A. CHEVALLIER and Y. CHORON (Compt. rend. Soc. Biol., 1937, **125**, 65—66).—These organs contain 3.3—15.5 and 6—10  $\times 10^{-3}\%$ , respectively.

H. G. R.

**Ascorbic acid in gastric juice.** G. A. PETERS and H. E. MARTIN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 76—78).—The ascorbic acid contents of human and canine gastric juices are 0.046—1.04 and 0.33—1.51 mg. per 100 c.c., respectively; those of the duodenum, ileum, colon, fundus, and pylorus decrease in the order named.

P. G. M.

**Determination of ascorbic acid (vitamin-C) in blood and urine.** V. A. DEVJATNIN and V. M. JOSIKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 85—88).—Blood or urine (4 c.c.) with 0.5% aq.  $Ca(OAc)_2$  (8 c.c.) and 25% aq.  $Hg(OAc)_2$  (4 c.c.) affords a clear centrifugate which is treated with and then freed from  $H_2S$ , and titrated with dichlorophenol-indophenol (I). Ascorbic acid (II) is recovered to the extent of 100%. Many reducing substances (including those present in blood) do not reduce (I). Blood contains 0.5—0.6 mg. of (II) per 100 c.c.

J. L. D.

**Errors in the determination of vitamin-C in urine after arsenobenzene therapy.** I. DAINOW and L. JANCU (Compt. rend. Soc. Biol., 1937, **125**, 244—246).—The reducing power of the urine is augmented after injection of arsenobenzene.

H. G. R.

**Post-mortem changes in the ascorbic acid content of the adrenals.** G. MOURIQUAND and P. VIENNOIS (Compt. rend. Soc. Biol., 1937, **125**, 289—290).—Reductions of 25, 38, and 58% in 24, 48, and 76 hr., respectively, after death were observed in guinea-pigs.

H. G. R.

**Determination of total vitamin-C in foodstuffs.** P. N. SEN-GUPTA and B. C. GUHA (J. Indian Chem. Soc., 1937, **14**, 95—102).—In determining the amount of ascorbic acid (I) by titration with 2:6-dichlorophenol-indophenol by the following methods: (a)  $CCl_3 \cdot CO_2H$ , (b)  $CCl_3 \cdot CO_2H$  and  $HCl$ , (c) heating in  $CO_2$  or  $N_2$  for different periods, (d) cold  $H_2S$ , (e) hot  $H_2S$ , (e) gives the highest val. and appears to record the free vitamin, (I) released by heating, and reversibly oxidised (I).

F. R. S.

**Combined ascorbic acid in plant tissues.** B. C. GUHA and J. C. PAL (Nature, 1937, **139**, 843—844; cf. this vol., 78).—EtOH and  $Et_2O$  extracts of cabbage when heated in  $N_2$  give higher ascorbic acid (I) vals. even when titrations are carried out after addition of  $CH_2O$  or after treatment with  $Hg(OAc)_2$ . Further evidence of the presence of combined (I) is provided by the higher vals. given by treatment of hot suspensions and extracts of cabbage with  $H_2S$  compared with those obtained at room temp.  $CHCl_3$  extracts of dried cabbage give a titre with the indophenol reagent only after heating in an aq. suspension, and most of this reduction val. disappears

when the heated extract is subjected to the action of a prep. of (I) oxidase. L. S. T.

**Vitamin-C in vegetables. VI. Determination of ascorbic acid by Tillmans' method.** G. L. MACK and D. K. TRESSLER (J. Biol. Chem., 1937, 118, 735—742).—The enzymic oxidation of ascorbic acid during determination by Tillmans' method is inhibited by the presence of 15% aq.  $\text{H}_2\text{SO}_4 + 2\%$   $\text{HPO}_3$ . Reduction with  $\text{H}_2\text{S}$  is thus rendered unnecessary, but when  $\text{H}_2\text{S}$  is used the reduction of substances other than dehydroascorbic acid is thus prevented. W. McC.

**Excretion test for vitamin-C deficiency.** E. P. RALLI, G. J. FRIEDMAN, and M. KASLOW (Proc. Soc. Exp. Biol. Med., 1937, 36, 52—54).—In normal subjects after intravenous injection of 100 mg. of ascorbic acid 40% is excreted in 3 hr., as compared with 11% in subnutrition and 2.6% in cases of scurvy. P. G. M.

**Effect of inorganic acids on catalytic oxidation of ascorbic acid.**—See A., I, 368.

**Vitamin-C [and scorbamic acid].**—See A., II, 274.

**Antiscorbutic properties of methyl 2-ketogluconate.** V. M. RODIONOV (Bull. Acad. Sci. U.R.S.S., 1936, 923—927).—Me 2-ketogluconate ( $\approx 0.05$  g. per day) protects guinea-pigs against scurvy. R. T.

**Vitamin-D developments.** F. B. MCKENZIE (Proc. Ann. 8th State Coll. Washington Inst. Dairying, 1935, 22—25).—Practical means of increasing -D in milk are discussed. CH. ABS. (p)

**Plant origin of a vitamin-D.** H. H. DARBY and H. T. CLARKE (Science, 1937, 85, 318—319).—The lipin fractions of *Sargassum*, but not those of *Ulva* and *Laminaria*, have antirachitic properties. The unsaponifiable fraction of the oils from *Sargassum* yielded a cryst. sterol identical with the fucosterol isolated from *Fucus vesiculosus*, but showing no selective absorption in the ultra-violet. Non-cryst. fractions of the oil show an absorption band at 260  $\mu$  superimposed on the absorption of carotenoids etc. The occurrence in plants of a vitamin-D must therefore be recognised. L. S. T.

**Effect of vitamin-E deficiency on the thyroid.** (MISS) M. M. O. BARRIE (Nature, 1937, 139, 286).—The young of vitamin-E-deficient female rats show symptoms of cretinism. L. S. T.

**Dietary factors concerned in nutritional muscular dystrophy.** S. MORGULIS and H. C. SPENCER (J. Nutrition, 1936, 11, 573—591).—At least two factors are concerned in the prevention and cure of muscular dystrophy. Both occur in fresh green lucerne and in whole wheat germ. One factor is present in cold-pressed wheat-germ oil, and the other in lettuce and in dry lucerne. One factor is destroyed by  $\text{FeCl}_3$  in  $\text{Et}_2\text{O}$ , by drying, or by extraction with  $\text{H}_2\text{O}$  or  $\text{EtOH}$ . A. G. P.

**Permeability of the vegetable cell to mineral salts.** M. V. HOMÈS (Arch. Biol., 1936, 47, 399—498).—Methods of determining permeability are critically reviewed. Analysis of the surrounding salt solu-

tion shows that, in turnip roots,  $\text{Cl}'$  can penetrate into the cell from solutions of concn.  $<$  that of the cell sap. Penetration is the greater the lower is the concn. of the surrounding medium; it varies with the cations present in the solution and increases in the order  $\text{NH}_4^+$ ,  $\text{Li}^+$ ,  $\text{Mg}^{++}$ ,  $\text{Ca}^{++}$ ,  $\text{Na}^+$ ,  $\text{K}^+$ . M. A. B.

**Physical analysis of the plasmolytic fragmentation of elongated protoplasts.** H. FREIFFER (Protoplasma, 1936, 25, 528—545). M. A. B.

**Band plasmolysis of the endodermis cells of *Cobaea scandens*.** L. SCHNEE (Protoplasma, 1936, 26, 97—99).—Plasmolysis in conc. aq. sugar or  $\text{NaCl}$  or in 70%  $\text{EtOH}$  causes the plasma of the starchy endodermis cells to contract into thin plates which remain attached to the sides of the cells at certain points, where the plasma probably penetrates the cell wall. M. A. B.

**Vacuole contraction and anthocyanophores in *Pulmonaria* petals.** F. WEBER (Protoplasma, 1936, 26, 100—107).—In *P. rubra* and *P. officinalis* a change of red pigment to blue accompanies vacuole contraction; the cell sap probably becomes alkaline through increased permeability of the tonoplast. Many of the epidermic cells contain dark red anthocyanophores of gel nature, surrounded by the cell sap also pigmented with anthocyanin red. These anthocyanophores probably arise from a primary (physiological) vacuole contraction. A secondary (pathological) vacuole contraction can also occur, whereby the colour changes to blue. The red anthocyanophores bleach with rise in temp. M. A. B.

**Effect of micrurgical treatment on the resting nucleus of plant cells. I. Puncturing experiments. II. Injection experiments.** T. PETERFI and H. KOJIMA (Protoplasma, 1936, 25, 489—500, 501—514).—I. A visible structure is produced in the structureless nuclear contents of the cells of *Tradescantia* anthers by disturbing or puncturing the nucleus. The phenomenon is probably not thixotropic but is a coacervation of the complex sol due to increased penetration of electrolytes into the nucleus.

II. Injection of  $\text{H}_2\text{O}$ , hypertonic  $\text{NaCl}$  solution, 0.001N-AcOH, and 0.001N-KOH into the cytoplasm of *Tradescantia* anther cells caused the formation of a visible structure in the nuclear substance similar to that produced by mechanical disturbance of the nucleus, thus confirming the theory that the changes are due to increased penetration of electrolytes from the cytoplasm through the nuclear membrane. M. A. B.

**Death resulting from freezing vegetable cells in liquid nitrogen at  $-190^\circ$ .** P. BECQUEREL (Compt. rend., 1937, 204, 1267—1269).—Epidermal cells and nuclei of the scales of the bulbs of *Allium cepa* shrink, when immersed for 10 min. in liquid  $\text{N}_2$ , as a result not of plasmolysis but of syneresis. J. L. D.

**Physico-chemical studies of the sap of vines.** E. BELTRAN, P. ALDEBERT, and A. GRASSET (Compt. rend. Acad. Agric. France, 1936, 22, 52—54).—Neutralisation curves for each sap are obtained and from them the buffer-coeff. curves. If these show many marked summits, they are highly buffered.

Vines with such saps are resistant to accidental changes of  $p_H$  in the soil. A. W. M.

**Morphogenic action of an aqueous medium on plants.** M. T. GERTRUDE (Compt. rend., 1937, 204, 1132—1134; cf. this vol., 80).—In *Veronica anagallis*, tissue grown under submerged conditions contained less total sugars, and during the whole period of growth less reducing sugars, less holoside hydrolysable by invertase, and less heteroside hydrolysable by emulsin than tissue produced in air. In submerged plants assimilation is probably checked at the stage at which complex N and P compounds are produced. A. G. P.

**Relation between rate of transpiration and rate of absorption of water in plants.** P. J. KRAMER (Amer. J. Bot., 1937, 24, 10—15).—In green ash, yellow poplar, loblolly pine, and sunflower plants day transpiration was > and night transpiration < the corresponding vals. for  $H_2O$  absorption. Plants grown in  $H_2O$  cultures behaved similarly to those in soil. Changes in transpiration precede and largely control those in absorption. A. G. P.

**Variations in leaves of cotton plants grown under irrigation in the Sudan Gezira.** G. B. PORTSMOUTH (Ann. Bot., 1937, [ii], 1, 277—291).—Successively developing cotton leaves may begin their growth with different constitution and subsequent changes may be dissimilar. The basic  $H_2O$  content of leaves on the same stem decreases steadily up to approx. the 15th node. Similar variations occur in the % of N, except that leaves produced in the second growth period show a slightly higher level of N as a result of the resumption of N intake following the maturation of the first crop of bolls. In individual leaves the total N increased with growth to a max. which was reached when the expansion of the lamina was complete. Subsequently the vals. diminished. Diurnal changes in  $H_2O$  content, together with the effects of irrigation, are examined. A. G. P.

**Influence of soil moisture and fertilisers on the specific conductivity of tomato plant sap.** A. C. FOSTER and E. C. TATMAN (Amer. J. Bot., 1937, 24, 35—39).—A close correlation is established between fertiliser applications and  $H_2O$  content of soil, the amount of  $H_2O$  used daily by plants, and the ultimate  $H_2O$  requirement of the plants. Among plants grown at different soil- $H_2O$  contents, there is a positive correlation between the soil- $H_2O$  content and the electrical resistance of the plant sap. Increasing supplies of soil- $NO_3^-$  or  $K_2SO_4$  are associated with increasing electrolyte contents of the sap as shown by decreased electrical resistance. The latter was influenced more by soil- $H_2O$  content than by fertiliser treatment. A. G. P.

**Donnan membrane equilibrium in the absorption of nutrients by plants.** Intake of nitrogen, phosphate, potassium, calcium, and magnesium by maize varieties.—See B., 1937, 598.

**Nitrogen nutrition and chemical composition in relation to growth and fruiting of the cucumber plant.**—See B., 1937, 599.

**Characteristics of the growth and mineral nutrition of hemp with simultaneously maturing male and female plants.** L. G. DOBRUNOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 521—524).—The increased productiveness of the new variety of hemp in which plants of both sexes mature simultaneously is partly accounted for by the greater growth, and better nutrition of the male plants. The root system of the new variety is more extensive and the mineral intake from the soil is accordingly greater. W. O. K.

**Evolution of the different forms of phosphorus [compounds] during forcing of the lily-of-the-valley.** R. QUETEL (Compt. rend., 1937, 204, 885—887).—In  $Et_2O$ -forced as in control plants, the amounts of lipin- (I), residual (II), and insol. P (III) rise rapidly during budding and flowering. At flowering, (I) and (III) in control plants are > in forced, but (II) has in forced plants nine times, in control plants five times, its initial val. The results are compared with similar data for N (A., 1936, 1165).

F. A. A.

**Excretion from leguminous root nodules.** G. BOND (Nature, 1937, 139, 675—676).—Analysis of the sand rooting medium in which soya-bean plants had been grown showed no evidence of excretion of fixed N at any stage in development, although extensive fixation occurred within the nodules (cf. this vol., 48). L. S. T.

**Preparation and identification of nucleic acids occurring in plant-cell nuclei.** R. FEULGEN, M. BEHRENS, and S. MAHDIHASSAN (Z. physiol. Chem., 1937, 246, 203—211).—Rye embryos, on milling, flocculation from  $C_6H_6$  and from  $C_6H_5-CCl_4$  (1:2 vols.), pptn. by  $Na_2CO_3$ , digestion with pancreatin [which contains nucleogelase and transforms  $\alpha$ - into  $\beta$ -thymonucleic acid (I)], pptn. by  $EtOH$  etc., yield (I), identified by hydrolysis and isolation of guanine, adenine, cytosine, and thymine. F. O. H.

**Nitrogen metabolism during germination of the lupin (*Lupinus albus*, L.).** R. ECHEVIN and A. BRUNEL (Compt. rend., 1937, 204, 881—883).—The total N of lupin seeds before germination contains 86% of protein-N. During germination this val. drops markedly, and 83% of the total N appears in the form of sol. compounds, mainly arginine, but also purine derivatives, including uric acid, allantoin, and allantoic acid. Urea is absent both before and after germination. Uricase appears during germination, and allantoinase is increased ten-fold; allantoicase is not detectable either before or after germination. F. A. A.

**Existence of an azoligase.** W. SKALLAU (Zentr. Bakt. Par., 1936, II, 93, 244—247).—No evidence of an increasing N content of germinating legume seeds was obtained. A. G. P.

**Effect of ascorbic acid and certain indole derivatives on regeneration and germination of plants.** W. DAVIES, G. A. ATKINS, and P. C. B. HUDSON (Ann. Bot., 1937, [ii], 1, 329—351).—Epinastic response of tomato plants was obtained by stem treatments with hetero-auxin or  $\beta$ -indolylpropionic

acid but not with ascorbic acid or other indole derivatives examined (see also A., 1936, 909).

A. G. P.

**Oxygen evolved by isolated chloroplasts.** R. HILL (Nature, 1937, 139, 881—882).—Fresh suspensions of chloroplasts obtained from various angiosperms with sucrose solutions do not evolve measurable quantities of  $O_2$  in light even in presence of  $CO_2$ . When suspended in an aq. extract made from a COMe<sub>2</sub>-leaf prep., however, measurable amounts of  $O_2$  are evolved on illumination. The activity of these preps. depends on their content of  $Fe^{+++}$ , which is reduced to  $Fe^{++}$ , and is the only reagent at present known to cause  $O_2$  evolution by free chloroplasts.

L. S. T.

**Carbon dioxide exchange rhythm and fruitfulness in plants of different reproductive habits.** R. H. ROBERTS, J. E. KRAUS, and N. LIVINGSTON (J. Agric. Res., 1937, 54, 319—343).—Photoperiodicity may not be due to photosynthetic activity. The form of  $CO_2$ -exchange curves is influenced by stomatal movements but is not greatly altered by artificial illumination beyond the normal day period. The curves become irregular during the reproductive stage.

A. G. P.

**Response of the respiratory system in mango and guava to alterations in the concentration of oxygen and nitrogen.** B. N. SINGH, P. V. V. SESHAGIRI, and S. S. GUPTA (Ann. Bot., 1937, [ii], 1, 311—323).—The  $CO_2$  output of mangoes and guavas increases on transference from cold storage ( $8^\circ$ ) to  $30^\circ$ , probably because of the change in solubility of  $CO_2$  in the  $H_2O$  present in the intercellular spaces. It is also increased by transferring the fruit from air to an atm. of  $N_2$ . The rate of  $CO_2$  production on transference from  $N_2$  back to air is directly related to the period of anaerobiosis. The min.  $CO_2$  output occurs in 9.2% of  $O_2$  in which condition the R.Q. (0.85) suggests that fats and carbohydrates may form the substrate for respiration.

A. G. P.

**Respiration of bananas.**—See B., 1937, 614.

**Photosynthesis and the absorption of radiation by plants.** G. R. BURNS (J. Amer. Chem. Soc., 1937, 59, 944—945).—The amount of photosynthesis in white-pine seedlings depends on the "primary absorption spectrum," which is determined from the reflexion of the needles to light of  $45^\circ$  incidence and the absorption of light by the plant pigments in COMe<sub>2</sub> solution of the same concn. as in the plant. No explanation of agreement with this arbitrary val. is offered.

E. S. H.

**Efficiency of utilisation of sunlight in growth of green plants under natural conditions.** W. NODDACK and J. KOMOR (Angew. Chem., 1937, 50, 271—277).—A lecture. Over a prolonged period the efficiency is approx. 0.6%, in agreement with results obtained with single cells.

J. S. A.

**Influence of water deficiency on photosynthesis and transpiration in apple leaves.** A. J. HEINICKE and N. F. CHILDERS (Proc. Amer. Soc. Hort. Sci., 1935, 33, 155—159).—Gradual drying of soil causes a reduction in the rates of photosynthesis and transpiration. The latter is the first to be

affected. Stomatal closing with lowered  $H_2O$  supply conserves  $H_2O$  to a greater extent than it diminishes photosynthesis.

A. G. P.

**Time course of photosynthesis for a higher plant.** E. D. McALISTER (Smithsonian Misc. Coll., 1937, 95, No. 24, 17 pp.).—A spectrographic (infrared) method of determining  $CO_2$  is described. The induction period in the photosynthetic activity of young wheat leaves varied with temp. and with the intensity of illumination in a manner similar to that in algae. Induction is associated with loss of  $CO_2$  in so far as photosynthesis is concerned. This loss increases with increasing light intensity. With intermittent (equal) periods of light and darkness induction is small at high frequencies (0.17 sec.) and  $>$  normal at 5—15 sec. With periods between 15 sec. and full daylight,  $CO_2$  assimilation falls to a min. at 1—5 min. and increases with extension of the periodicity. Respiration recommences immediately the illumination is cut off at the same rate as before the exposure. Experimental data support the views of Francke and of Kautsky on the luminescence of chlorophyll.

A. G. P.

**Effects of light and of oxygen on the uptake of sugar by the foliage leaf.** E. PHILLIS and T. G. MASON (Ann. Bot., 1937, [ii], 1, 231—238).—Formation of starch in previously de-starched cotton leaves when placed in sugar solutions is accelerated independently by  $O_2$  and by light. The action results from accelerated absorption of sugar by the leaf rather than from any disturbance of the sugar-starch equilibrium. Light probably increases the permeability of plasma membranes whereas  $O_2$  affects the solvent capacity of the cytoplasm.

A. G. P.

**Growth substances in *Elodea canadensis*.** M. HOMES and G. VAN SCHOOR (Bull. Acad. roy. Belg., 1937, [v], 23, 183—193).—Increase of the internodal distance is inhibited when the growing point is removed. Replacement of the point on the cut stem induces growth even if a thin plate of agar is interposed between the cut surfaces. Growth-promoting substances probably diffuse back from the point. Aq. extracts of the growing point cause the decapitated shoots to grow and induce preferential growth on the treated side of shoots.

J. L. D.

**Yeast growth-substance in buds and leaves.** J. DAGYS (Protoplasma, 1936, 26, 20—44).—The yeast growth-substance present in buds and cambium of oak and willow and in pine needles is thermostable, readily sol. in 90% MeOH and abs. EtOH, fairly sol. in abs. COMe<sub>2</sub>, slightly sol. in  $CHCl_3$  and  $Et_2O$ , insol. in light petroleum and  $C_6H_6$ . It is adsorbed by animal C but not by kaolin, not pptd. by  $Pb(OAc)_2$ , is unaffected by autoclaving with HCl, but is partly inactivated by autoclaving with NaOH and also by oxidation with  $H_2O_2$  or  $HNO_3$ .

M. A. B.

**Production and distribution of growth hormone in shoots of *Aesculus* and *Malus* and its probable role in stimulating cambial activity.** G. S. AVERY, jun., P. R. BURKHOLDER, and H. B. CREIGHTON (Amer. J. Bot., 1937, 24, 51—58).—Dormant winter buds of *A. hippocastanum* gave a negative *Avena* test. Growth hormone (I) appears

in *Aesculus* and *M. malus* as the buds swell and max. amounts coincide with the period of rapid extension of current-season shoots. Later the proportion declines with the rate of growth. Throughout the season concns. of (I) in fruit-bearing are  $>$  in leaf-bearing shoots. In stems the (I) content decreases from the terminal portions downward; it is produced largely in the terminal region and is translocated basipetally into the older parts of the stem. This movement is paralleled by initiation of cambial activity. A. G. P.

**Role of auxin in leaf development in *Solidago* species.** R. H. GOODWIN (Amer. J. Bot., 1937, 24, 43—51).—Differences in the rate of development of basal rosette leaves of *S. sempervirens*, *S. rugosa*, and of the hybrid, and the effects of the removal of these leaves on the development of the younger leaves, are paralleled by variations in the amount of auxin present. Diffusion of auxin from cut leaf stems is small in the early stages of growth, increases to a max. at the period of most rapid development, and subsequently declines towards maturity. The amount of auxin per unit wt. of fresh leaf tends to be inversely related to the wt. of the leaf. A. G. P.

**Distribution of substances acting as vegetable auxins in *Discoglossus pictus*, Otth.** H. BERRIER (Compt. rend. Soc. Biol., 1937, 124, 1319—1321).—These substances are distributed generally through the adult organism but are most abundant in tissues connected with excretory functions. H. G. R.

**Determination of auxin-B.** L. REUTER (Protoplasma, 1936, 25, 614—628).—The method is based on measurement of the increase in size of yeast cells using a hæmatocrit or similar apparatus. M. A. B.

**Inactivation of the auxins.** H. ERXLEBEN (Chem. Weekblad, 1937, 34, 317—318).—Inactive auxin-a (I) contains two stereoisomerides, *pseudoauxin-a*<sub>1</sub> and -a<sub>2</sub>, the  $\delta$ -OH being displaced to the  $\zeta$  position and the double linking to the  $\delta\epsilon$  position. Oxidation of (I) with O<sub>3</sub> gives the corresponding *acyloin*. In *pseudoauxin-b* the CO is situated in the  $\beta$ -, the double linking in the  $\delta\epsilon$ -, and the OH in the  $\zeta$ -position. Auxin-a lactone also becomes inactive on keeping or very rapidly by irradiation with ultra-violet light, forming *lumiauxin-a lactone*, C<sub>18</sub>H<sub>28</sub>O<sub>3</sub>, containing OH and  $\cdot C:C \cdot$  groups, by loss of H<sub>2</sub>O at the  $\beta\gamma$ -linking, and showing a strong absorption band at 295 m $\mu$ . Oxidation with O<sub>3</sub> affords a cyclic ketone, C<sub>13</sub>H<sub>24</sub>O. S. C.

**Effects of the length of X-ray waves on seeds.** A. A. BLESS (Proc. Nat. Acad. Sci., 1937, 23, 194—196).—X-Irradiation of the seeds of yellow dent maize increases the growth of the plant after germination. The effect is independent of  $\lambda$  between 0.6 and 1.2 Å., but the optimum dose depends on the time after germination at which observations are made. W. O. K.

**Why do leaves appear bright in infra-red light?** R. MECKE and W. C. G. BALDWIN (Naturwiss., 1937, 25, 305—307).—EtOH solutions of chlorophyll, xanthophyll, and other plant pigments and different kinds of leaves lose their characteristic

optical properties so far as these are not conditioned by structural differences as soon as the crit.  $\lambda$  700—750 m $\mu$  is exceeded. Leaves viewed in infra-red light appear therefore colourless and bright and possess a high power of reflexion of light rays. P. W. C.

**Physiological activity of rust-infected cereal leaves.** G. GASSNER and G. GOEZE (Phytopath. Z., 1936, 9, 371—386).—Inoculation of susceptible varieties of wheat with rust diminishes the chlorophyll content and rate of CO<sub>2</sub> assimilation and increases transpiration. A. G. P.

**Micro-biological decomposition of wood.** I. F. KOMAROV and G. FILIMONOVA (J. Appl. Chem. pine or birch attacked by *Merulius lacrymans*, Poly-Russ., 1937, 10, 487—496).—The OMe content of *porus destructor*, or *Fomes igniarius* is  $<$  that in unattacked wood, to an extent varying with its lignin content and with the type of mould. The Ac and uronic acid contents are not affected. The content of H<sub>2</sub>O- and 1% NaOH-sol. substances (tannins, reducing sugars, and salts) rises, and the pentosan content falls, in all cases, whilst the contents of EtOH-C<sub>6</sub>H<sub>6</sub>-sol. substances, cellulose, and lignin are  $>$  or  $<$  the initial vals., depending on the nature of the mould and its substrate. R. T.

**Effect of certain enzymes and amino-acids on crown gall tissues.** P. A. ARK (Science, 1937, 85, 364).—The injection of a mixture of *Erwinia carotovora* into crown galls on geranium, young tomato, and sunflower quickly destroys the galls. Pepsin, papain, diastase, cysteine hydrochloride, leucine and isoleucine, but not tryptophan and tyrosine, act similarly. L. S. T.

**Frencing of tobacco and thallium toxicity.** E. L. SPENCER (Amer. J. Bot., 1937, 24, 16—24).—Of 33 toxic elements examined only Tl caused chlorosis in the youngest leaves and the production of strap-shaped leaves in tobacco. The induced chlorosis was controlled by application of Ca(NO<sub>3</sub>)<sub>2</sub>, KI, or Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>. These treatments also prevent frencing. The natural occurrence of frencing may be due to toxic concns. of Tl in soil. A. G. P.

**Vital staining of plant cells with neutral-red.** S. STRUGGER (Protoplasma, 1936, 26, 56—69).—The distribution of the neutral-red (I) in plant cells depends on the  $p_H$  of the medium. Below  $p_H$  7.1 the cell membrane, above  $p_H$  7.1 the vacuole, is stained. If cells stained in alkaline solution are placed in acid solution, in liquid paraffin, under conditions of O<sub>2</sub> deficiency, or plasmolysed in glucose solution, (I) is transferred from the vacuole to the cell membrane. The reverse process is effected by treating cells stained in acidified distilled H<sub>2</sub>O with tap-H<sub>2</sub>O or alkaline solution. M. A. B.

**Theory and technique of nuclear staining.** P. F. MILOVIDOV (Protoplasma, 1936, 25, 570—597).—Many plant cell nuclei formerly believed to give negative staining reactions can be stained by using a suitable technique. Faint or negative staining is very frequent in cells containing much tannin and addition of tannin to other cells inhibits the normal staining. In many cases a negative reaction may be due to

such inhibition by substances, probably tannins, occurring in the cell. M. A. B.

**Nitrogen partition in three native varieties of pigeon peas (*Cajanus cajan* [L.], Millsp.).** A. M. LOCSIN (Philippine Agric., 1935, 24, 481—487).—Analyses show H<sub>2</sub>O 10.2—15.6, fat 8.2—29.7, ash 4.2—4.9, fibre 8.3—9.2, total N 3.1—3.6%. The N partition is: amide 9.7—10.9, humin 1.3—1.5, arginine 14.6—17.1, histidine 3.3—6.5, lysine 10.5—12.2, NH<sub>4</sub>, 51.15, other N 0.15—0.98%. CH. ABS. (p)

**Sulphur content of some Indian grasses.** F. J. WARTH and T. S. KRISHNAN (Indian J. Vet. Sci., 1937, 7, 54—58).—With grasses growing side by side, species of Chlorideae contained more SO<sub>4</sub> than other species (0.27% against 0.06% of dry matter). No extra S occurred in the protein. Grass stalks contained more SO<sub>4</sub> than the leaf but migration of SO<sub>4</sub> to the leaf occurred on drying. W. L. D.

**Comparative elementary composition of floral structures.** C. SOSA-BOURDOUIL (Compt. rend., 1937, 204, 997—999).—The pollen grains of *Acanthus* contain a higher % of C, H, and N than the remainder of the flower. The andræcium and gynoecium are similar in composition before maturity but when pollen differentiates, the composition of the andræcium, but not that of the gynoecium, changes even after fertilisation. In *Ranunculus asiaticus*, L., the semi-petaloid stamens have a composition intermediate between that of the true stamens and of petals. The pollen of a variety of plants has C 50.3—53.4, H 7—7.5, and N 5.8—6.9 whereas the ovules have C 45.0—46.7, H 5.9—6.5, and N 4.0—5.7%. J. L. D.

**Carbohydrates in extracts of flowers of *Opuntia Ficus-Indica*.** G. SANFILIPPO and A. CANNAVÀ (Boll. Soc. ital. Biol. sperim., 1937, 12, 73—74).—Aq. extracts contain free maltose (and possibly glucose) and a mannogalactan. F. O. H.

**Chemical examination of *Clerodendron infortunatum*.** I. H. N. BANERJEE (J. Indian Chem. Soc., 1937, 14, 51—57).—The dried leaves of this verbenaceous shrub (the Indian "bhint" or "bhat," used as vermifuge) give, on extraction by light petroleum, the bitter substance *clerodin* (I), m.p. 161—162°, with a sterol, m.p. 147—148° (Ac derivative, m.p. 127—128°), an alcohol, m.p. 75°, linolenic and oleic acids, etc. The EtOH extract contains gallic acid, a sugar (osazone, m.p. 202—203°), etc. (I) is not hæmolytic, and is non-toxic to the rabbit or to *B. coli*, but is toxic to earthworms, to small fish, and to mosquito larvæ. E. W. W.

**Constitution of artostenone, a ketonic sterol from *Artocarpus integrifolia*.**—See A., II, 294.

**Lucaenol, a principle from the seeds of *Lucaena glauca*, Benth.**—See A., II, 296.

**Morellin, a constituent of the seeds of *Garcinia morella*.**—See A., II, 298.

**Quassin and neoguassin.**—See A., II, 297.

**Bark of American larch.** K. E. LARSEN and E. V. LYNN (J. Amer. Pharm. Assoc., 1937, 26, 288—290).—Starch, pentosans, tannin, saponin, and resin (10%) but no alkaloids are found. F. O. H.

**Constituents of kaoliang.** S. HIRAO (J. Agric. Chem. Soc. Japan, 1935, 11, 921—924).—Succinic and other unidentified acids and a yellow glucoside, m.p. 249—250° (probably quercimeritrin), were isolated from hot aq. extracts of kaoliang.

CH. ABS. (p)

**Glucoside of *Belamecanda chinensis* (L.) (*Pardanthus chinensis*, Ker), shekanin (tectordin).**—See A., II, 276.

**Synthesis of lusitanicoside (chavicol-β-rutinoside), the glucoside from *Cerasus lusitanica*, Lois.**—See A., II, 277.

**Chemistry and pharmacology of *Phytolacca americana*, N.F.** S. W. GOLDSTEIN, G. L. JENKINS, and M. R. THOMPSON (J. Amer. Pharm. Assoc., 1937, 26, 306—312).—Analytical data for the root examined by the U.S.P. X method for crude drugs are given. Aq. EtOH extracts yield a terpeneless oil, *d* 0.9977. The root contains hemicellulose, isosaccharic acid, gum, resin, H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>, saponin, and starch, but no reducing sugar or active alkaloid. The pharmacological activity is due to < two principles, one sol. in EtOH and the other in H<sub>2</sub>O. F. O. H.

**Alkaloids of *Convolvulus pseudocanthabricus*, *Arundo donax*, and *Cytisus caucasicus*.**—See A., II, 311.

**Alkaloids of *Anabasis aphylla*.**—See A., II, 310.

**Components of *Cetraria islandica*.**—See A., II, 290.

**Lignin and resin.** B. L. VANZETTI (Atti V Congr. Naz. Chim., 1936, 14, 932—937).—From a consideration of the structure of olivil and isoolivil (A., 1929, 1064) the biogenetic relationship between lignin and resin is discussed. L. A. O'N.

**Organic constituents of a recent deposit from Chincoteague Bay, Virginia.**—See A., I, 381.

**Microscopically heterogeneous mode of reaction of fibres.** A. FREY-WYSSLING (Protoplasma, 1936, 26, 45—50).—Under the polarising microscope nitration of cellulose fibres appears to proceed in a homogeneous fashion, whereas acetylation appears to be heterogeneous. This is due to the different swelling action of the various reaction media on the cellulose. If the reaction bath swells the primary layer, as in nitration or denitration in H<sub>2</sub>O, the fibre reacts homogeneously; if it shrinks the primary layer, as in acetylation in C<sub>6</sub>H<sub>6</sub> or denitration in EtOH, fissures develop in this layer, allowing increased penetration at these points, and the fibre reacts heterogeneously. M. A. B.

**Vapour method of changing reagents and of dehydration.** C. B. BRIDGES (Stain Tech., 1937, 12, 51—52).—Good preps. are obtained by dehydrating acetocarmine smears with EtOH vapour and applying euparal directly. E. M. W.

**Staining cells with Sudan III in a water phase.** J. DUFRENOY and H. S. REED (Stain Tech., 1937, 12, 71—72).—Intravacuolar spheres of lipin are stained bright orange by a suspension produced by dissolving Sudan III in methylal and adding the solution to H<sub>2</sub>O. E. M. W.

**Histological stain from black walnut (*Juglans nigra*, L.).** C. R. LIMBER and J. T. GAMBLE (Stain Tech., 1937, 12, 49—50).—A slow nuclear stain is prepared from the black walnut. A mordant is necessary and Fe alum is recommended. E. M. W.

**Microchemical detection of cystoliths by Molisch's method.** Means of detecting reduction phenomena brought about in cystoliths by ultra-violet light. O. RICHTER (Mikrochem., Molisch Festschr., 1936, 350—365).—By the use of 0.1%  $\text{AgNO}_3$  in Molisch's test for  $\text{CaCO}_3$ , reduction occurs only where the tissue has been irradiated with light of  $\lambda < 3000 \text{ \AA}$ . Cystoliths of the leaves of *Urtica dioica*, after storage in the dark, show reduction only in irradiated areas, and  $\text{CaCO}_3$ , on substrates of cellulose or starch (filter-paper or potato tissue), shows the same effect. J. S. A.

**Significance of microchemistry for limnological investigations.** F. RUTTNER (Mikrochem., Molisch Festschr., 1936, 379—386).—A review. J. S. A.

**Preservation of [specimens of] the most usual wood reactions.** L. LOHWAG (Mikrochem., Molisch Festschr., 1936, 314—318).—Permanent standard specimens may be made of the  $\text{NH}_4\text{Ph.H}_2\text{SO}_4$  reaction, but not of the phloroglucinol or Maile tests. J. S. A.

**Technique of measuring peptisation processes in proteolysis.** I. P. STEFANOVITSCH (Biochimia, 1936, 1, 699—704).—Collagen is maintained in contact with the peptising agent for 18 hr., and the product is treated with 4%  $\text{NaOAc}$  (65°; 2.5 hr.). The amount of gelatin going into solution, as compared with untreated collagen, is a measure of peptising activity. R. T.

**Application of drop reaction to the ninhydrin test.** E. ABDERHALDEN (Mikrochem., Molisch Festschr., 1936, 1—2).—1—2 drops of filtered extract are treated with 1 drop of 2% ninhydrin (I), and evaporated at 100°. For the detection of differences in the concn. of substances giving the (I) reaction, the use of a reagent containing 1 part of 1% (I) + 39 parts of aq. fructose, with thymol as a preservative, is preferable, the solutions being measured out accurately. J. S. A.

**Inhibitors of colour development in the Sullivan method for cystine.** J. C. ANDREWS and K. C. ANDREWS (J. Biol. Chem., 1937, 118, 555—567).—Ascorbic acid, adrenaline,  $\text{H}_2\text{S}$ , photographic developers, and compounds producing sulphides in alkaline solutions give rise to low results, e.g., in urine. Oxidation of inhibitors by aeration prior to cystine determination is recommended as is the use of alkaline (2N) aq.  $\text{NaCN}$ . P. G. M.

**Determination of barbiturates in blood and urine.** J. T. BRUNDAGE and C. M. GRUBER (J. Pharm. Exp. Ther., 1937, 59, 379—392; cf. Koppányi et al., A., 1935, 245).—After acidification, diluted urine or deproteinised blood is shaken with activated C, which is then mixed with  $\text{CaSO}_4$  and extracted with  $\text{Et}_2\text{O}$ —light petroleum (b.p. 30—40°) (1:1). The extracted material is treated with  $\text{Co}(\text{OAc})_2$  and  $\text{NH}_4\text{Pr}^s$  and the colour produced compared with

that of a standard. The mol. wt. of barbiturates (I) is not directly related to the depth of the colour. Possibly the substance excreted in the urine is a degradation product of (I). Some (I) disappear from the blood very rapidly (<1 min.) after injection. W. McC.

**Spectrophotometric studies of colour development in analysis of sugar by the Benedict method and of cholesterol by the Liebermann-Burchard reaction.**—See A., II, 313.

**Determination of fumaric acid in protein solutions containing succinic acid.**—See A., II, 313.

**Apparatus for micro-determination of ammonia-nitrogen by distillation and aeration.** I. GOLDBERG and R. F. BANFI (Rev. soc. argentina biol., 1935, 11, 440—448).—The alkaline solution is heated under a reflux condenser. A slow air current through the apparatus carries the  $\text{NH}_3$  through the condenser to an acid trap. CH. ABS. (p)

**Determination of small amounts of arsenic in biological material.** K. HINSBERG and M. KIESE (Biochem. Z., 1937, 290, 39—43).—A method is described in which the org. material (organ, secretion, etc.) is ashed in As-free glass with a mixture of  $\text{HClO}_4$ ,  $\text{HNO}_3$ , and  $\text{H}_2\text{SO}_4$ , the As separated as  $\text{AsCl}_3$  in a stream of  $\text{HCl}$ , converted into  $\text{AsH}_3$ , and determined by reduction of  $\text{AuCl}_3$ . P. W. C.

**Biochemistry of fluorine. II. Determination in blood and [mineral] waters.** K. KRAFT and R. MAY (Z. physiol. Chem., 1937, 246, 233—243; cf. this vol., 103).—A micro-method, based on the  $\text{H}_2\text{O}$ -distillation of  $\text{H}_2\text{SiF}_6$  from the ashed material in 50%  $\text{H}_2\text{SO}_4$  + powdered glass at 130—140° into 2N- $\text{NaOH}$  which is subsequently titrated by the Kolthoff-Stansby method (A., 1934, 500), is described. Data for the F content of normal and diseased (Basedow) blood and of some mineral  $\text{H}_2\text{O}$  are tabulated. F. O. H.

**Micro-determination of iodine in biological material.** (A) H. DOERING. (B) H. LOHR and H. WILMANN (Biochem. Z., 1937, 290, 272—274, 275—276; cf. this vol., 82).—(A) Wilmann underestimates the accuracy attainable by the author's method. The EtOH extract must be absolutely free from org. matter.

(B) A reply.

W. McC.

**Use of thorium nitrate for rapid ashing of serum and urine.** I. For subsequent potassium determinations. M. B. STRAUSS (J. Biol. Chem., 1937, 118, 331—335).— $\text{Th}(\text{NO}_3)_4$  catalyses dry ashing and prevents volatilisation of K so that by using a temp. of 750° ashing is completed in 15 min. Any soluble Th is pptd. in extracting the ash with  $\text{H}_3\text{PO}_4$ , K being determined as platinichloride. The difference between results of Th and of  $\text{H}_2\text{SO}_4$  ashing averages 2%, which is within the limits of accuracy of the K determination. The error in recovery of added standard solutions was >2.6%.

R. M. M. O.

**7-Iodo-8-hydroxyquinoline-5-sulphonic acid as a reagent for the colorimetric determination of ferric iron in biological products.**—See A., I, 376.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

AUGUST, 1937.

**Relation between hypoglycæmia and anoxæmia.** L. F. MOLDAVSKY and E. GELLHORN (Proc. Soc. Exp. Biol. Med., 1937, 36, 92—94).—The rise in blood pressure which occurs in  $O_2$  deficiency is magnified by injection of insulin, the latter effect being offset by injection of glucose. P. G. M.

**Influence of carbon dioxide on blood pressure reaction to oxygen deficiency.** E. H. LAMBERT and E. GELLHORN (Proc. Soc. Exp. Biol. Med., 1937, 36, 169—171).—The beneficial effect of  $CO_2$  in  $O_2$  deficiency is ascribed in part to its direct action on the circulation as well as to its effect on respiration. W. O. K.

**Regeneration of carbonic anhydrase in the blood of *Rana salata*.** R. MARGARIA and R. FERRARI (Enzymologia, 1937, 2, 117—120).—After perfusion of a frog with Ringer's solution for 30 min. carbonic anhydrase (I) is completely removed from the blood. (I) reappears in the circulating fluid within 30 hr. from the perfusion and after 10 days increases to 24% of the normal val. During regeneration of the corpuscles their (I) content increases up to a max. of 9 times the normal. (I) and hæmoglobin vary independently in the erythrocytes. E. A. H. R.

**Hartridge reversion spectroscope for examination of blood for carbon monoxide; improvements in design, assembly, and technique.** R. C. FREDERICK (Analyst, 1937, 62, 452—454). E. C. S.

**Factors influencing sedimentation rate of erythrocytes.** J. ZOZAYA (Proc. Soc. Exp. Biol. Med., 1937, 36, 182—186).—Sedimentation of blood corpuscles depends on their concn., but not significantly on the albumin:globulin ratio or total protein of the serum. Of the various serum-protein fractions, fibrinogen and euglobulin promote and albumin retards sedimentation, whilst pseudoglobulin is intermediate. Lecithin lowers and cholesterol increases the sedimentation rate, whilst various metallic ions exert effects corresponding with their position in the Hofmeister series. W. O. K.

**Modifications of the Rous-Turner solution for preservation of bird erythrocytes.** A. GOLDEN and M. R. IRWIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 234—236).—Chick, pigeon, or dove erythrocytes are best preserved in a mixture of (a) 100 c.c. of Locke's solution + 32—34 c.c. of  $H_2O$ , and (b) an equal vol. of 4.2% or 5.4% aq. glucose. W. O. K.

**Formation of erythrocytes in the embryonic pancreas.** R. MICHALOWSKI (Compt. rend. Soc. Biol., 1937, 125, 163—166).—The "cloudy cells" of

Laguesse in the pig's embryo cannot synthesise hæmoglobin or transform it into erythrocytes. H. G. R.

**Coupling of respiration and phosphorylation of adenylic acid in the hæmolysate of horse erythrocytes.** A. LENNERSTRAND (Naturwiss., 1937, 25, 347—348).—The system hæmolysed horse erythrocytes + hexosediphosphoric acid + pyocyanin (I) + cozymase (II) utilises  $O_2$ , and on addition of  $PO_4'''$  the utilisation increases, part of the  $PO_4'''$  becoming fixed organically. No  $CO_2$  is formed and adenosinetriphosphoric acid (III) cannot replace (II). Addition of  $CH_2I \cdot CO_2H$  inhibits  $O_2$  utilisation and phosphorylation completely but NaF and  $Na_2C_2O_4$  are without effect. Adenylic acid (IV) added to the system along with  $PO_4'''$  is converted into (III) and simultaneously the org. P is decreased. The phosphorylation of (IV) does not occur if (I) or (II) is absent, phosphorylation being coupled with the oxidation process. P. W. C.

**Effect of scalding on erythrocyte and leucocyte counts and hæmoglobin in rabbits.** O. LAMBRET, J. DRIESSENS, and M. CORNILLON (Compt. rend. Soc. Biol., 1937, 125, 661—662).—A reduction, corresponding with the decrease in the circulating blood, was observed. H. G. R.

**Leucocytosis of parturition.** E. M. BOYD, G. W. BLUNKINSOP and G. MYLKS, jun. (Proc. Soc. Exp. Biol. Med., 1937, 36, 300—301).—No significant change in lipin concn. of leucocytes occurs during parturition. P. G. M.

**Erythrocruorins (hæmoglobins of invertebrates).** J. ROCHE and R. COMBETTE (Bull. Soc. Chim. biol., 1937, 19, 613—626).—The erythrocruorins of *Arenicola marina*, *Dasybranchus caducus*, and *Glycera gigantea* possess a high arginine (10%) and a low lysine (<5%) content, vary amongst themselves in solubility etc., and have a mol. wt. (determined by the osmotic pressure method) of 362,000, 26,200, and 56,600, respectively (cf. this vol., 164). P. W. C.

**Magnetic properties and structure of ferri-hæmoglobin (methæmoglobin) and its compounds.**—See A., I, 293.

**Crystallisation of carboxyhæmoglobin from dried blood of various animal species and its application to forensic medicine.** E. BROCCA (Atti R. Accad. Lincei, 1937, [vi], 23, 368—371; cf. A., 1935, 640).—From experiments, the rule is proposed that if either fresh blood that has been hæmolysed by saponin, or blood that has been dried for

some months and taken up in distilled  $H_2O$ , is found capable, when treated with  $CO$ , of giving cryst. carboxyhaemoglobin, it is not human blood.

E. W. W.

**Determination of bilirubin in blood-plasma.** G. A. D. HASLEWOOD and E. J. KING (Biochem. J., 1937, **31**, 920—923).—Plasma (1 c.c.) and diazo-reagent (0.5 c.c.) are mixed and treated with saturated  $(NH_4)_2SO_4$  (0.5 c.c.) and  $EtOH$  (3 c.c.). The mixture after shaking and keeping is filtered and the clear filtrate compared with a Me-red standard using a green light filter.

P. W. C.

**Blood-protein in anaphylactic states.** A. GARPUY and P. VALDIGUIE (Compt. rend. Soc. Biol., 1937, **125**, 345—347).—The ratio albumin : globulin is normal during a crisis but is increased during the intermediate periods.

H. G. R.

**Physico-chemical properties of serum-proteins isolated by the acetone method.** A. BOUTARIC (Protoplasma, 1936, **18**, 286—298; Chem. Zentr., 1936, i, 3355).—Comparison of physical properties of blood sera with those of aq. suspensions of the proteins obtained by the  $COMe_2$  method indicates that at low temp. the method separates the protein mol. as such.

A. G. P.

**Influence of vitamin-C on the colloid-osmotic pressure and the protein content of blood-serum.** I. GARTA (Biochem. Z., 1937, **290**, 364—369).—The colloid-osmotic pressure and the albumin : globulin ratio of guinea-pig's serum decrease during scurvy, and on administration of ascorbic acid (I) increase again, as does also the total protein content. The effect is due to the antagonistic action of thyroxine and (I).

P. W. C.

**Optical activity of sera and of solutions of their proteins separated by the cold acetone method.** C. ACHARD, A. BOUTARIC, and M. ROY (Compt. rend., 1937, **204**, 1288—1290).—The  $COMe_2$  extraction method separates serum-proteins which, when dissolved in 0.1N-NaOH, have the same  $[\alpha]_D$  as the original serum.

J. L. D.

**Proteins of transudates (ascites) and of serum.** J. ROCHE, J. OLMER, and L. SAMUEL (Compt. rend. Soc. Biol., 1937, **125**, 154—156).—The ratio albumin : globulin of the transudate is  $>$  that of the serum.

H. G. R.

**Dissociation of [serum]-globulin into the viscous protein and haemoglobin.** M. DOLADILHE (Compt. rend. Soc. Biol., 1937, **125**, 409—410).—Hofmeister's globulin is a mixture of the viscous protein and haemoglobin.

H. G. R.

**Albumin, globulins, and fibrinogen of serum and plasma.** W. R. CAMPBELL and M. I. HANNA (J. Biol. Chem., 1937, **119**, 15—33).—A method for the determination of albumin and globulins in serum using  $Na_2SO_3$  as precipitant and a  $Cu-Se-H_2SO_4-H_3PO_4$  mixture as protein digestant is described. Using 12.5%  $Na_2SO_3$  fibrinogen can be rapidly salted out from oxalated, citrated, or heparinised plasma. Using various concns. of  $Na_2SO_3$ , the globulin fractions represent zones of max. pptn. of protein and they parallel the content of fibrinogen, euglobulin, and pseudoglobulins-I and -II in the plasma. The

euglobulin and pseudoglobulin-I fractions are represented in human placental blood.

J. N. A.

**Globins. IV. Combination of globins with protohaematin and the mol. wt. of synthetic haemoglobins.** J. ROCHE and R. COMBETTE (Bull. Soc. Chim. biol., 1937, **19**, 627—641; cf. this vol., 111).—A method is outlined for the prep. of natural globin (I) of sheep, rabbit, ox, and pig, and of synthetic methaemoglobin (II) [protohaematin (III) + (I)] of horse, rabbit, and ox. The mean mol. wts. of these various natural  $[K_3Fe(CN)_6 + \text{pigment}]$  and synthetic (II), determined by the osmotic pressure method, are 63,400 and 63,300, respectively, and in solution they show no marked tendency to polymerise. The synthetic (II) are, however, more readily degraded into (III) and (I) by bases than are natural (II).

P. W. C.

**Reactions between coagulating acids and proteins.** L. ABRAHAM (Compt. rend. Soc. Biol., 1937, **125**, 382—386).—Coagulation of plasma-proteins with  $HNO_3$  and  $CCl_3CO_2H$  corresponds with salt formation, whilst with phosphotungstic acid pptn. occurs in alkaline medium above the isoelectric point.

H. G. R.

**Lipoproteins of blood-serum. Nature of the constituent proteins.** M. A. MACHEBŒUF and M. JANUSZKIEWICZ (Bull. Soc. Chim. biol., 1937, **19**, 694—706).—The prep. of the undenatured proteins forming the lipoproteins (I) of serum is described and the proteins are shown to be identical in properties with serum-albumins. (I) are not simple adsorption products.

P. W. C.

**Lipins of different protein fractions of blood-serum.** J. JANICKI and D. ASSENHAJN (Biochem. Z., 1937, **291**, 21—33).—Sera from different species and different individuals in the same species differ, sometimes greatly, in the lipin (I) content of their proteins. (I) is not removed by exhaustive extraction with  $Et_2O$  followed by extraction with  $CH_2Cl_2$ . The (I) content of serumalbumin (II) of goose- is  $>$  that of (II) of horse-, ox-, and sheep- and (I) is much more readily removed from goose- (II) than from horse-, ox-, and sheep- (II). The (I) content of euglobulins (III) differs from that of pseudoglobulins (IV). (I) of  $H_2O$ -sol. globulins (V) is more easily extracted than is (I) of  $H_2O$ -insol. (V), the insolubility of which appears to be due to their (I) content. Electrodialysis removes more (I) from (II) than does ordinary dialysis. The cholesterol : P ratios of (II) are : horse and goose approx. 14, sheep 17.2, ox 21.9. In (V) this ratio varies greatly, in (III) being usually  $<$  in (IV).

W. McC.

**Colorimetric determination of lipid phosphorus [lecithin] in the blood.** R. N. CHOPRA and A. C. ROY (Indian J. Med. Res., 1936, **24**, 479—486).—Methods so far used give untrustworthy results but accuracy is obtained by extracting the lecithin by Bloor's method (A., 1918, ii, 452), digesting it as described by Roe *et al.* (A., 1926, 763), and applying the colorimetric technique of Benedict and Theis (A., 1924, ii, 700).

NUTR. ABS. (m)

**Lipins of blood in new-born infants.** E. M. BOYD (Amer. J. Dis. Child., 1936, **52**, 1319—1324).—

The lipin content of the erythrocytes is the same in children as in adults. In newborn children the lipin content of the plasma is < in adults, the vals. as % of those for normal adults being: total lipins 34, neutral fat 58, total fatty acids 40, total cholesterol (I) 21, (I) ester 17, free (I) 30, phospholipin 31.

NUTR. ABS. (m)

**Cholesterol and fatty acids in blood-plasma of male and female rats.** H. H. WILLIAMS, J. MELVILLE, and W. E. ANDERSON (Proc. Soc. Exp. Biol. Med., 1937, 36, 292—295).—Free cholesterol in plasma averages 32 and 30% of the total, whilst the fatty acid concn. averages 121 and 150 mg. per 100 c.c. in male and female rats respectively.

P. G. M.

**Cholesterol content of blood-serum, -plasma, and erythrocytes.** E. CHABROL and J. L. PARROT (Compt. rend. Soc. Biol., 1937, 125, 432—434).—The ratio of cholesterol (I) in the plasma to that in the erythrocytes decreases as the val. for plasma-(I) decreases.

H. G. R.

**Determination of blood-cholesterol. Precipitation of the cholesterol-digitonin complex in water-acetone-trichloroethylene medium.** M. PAGET and G. PIERRART (Compt. rend. Soc. Biol., 1937, 125, 654—657).—Pptn. of cholesterol in  $C_2HCl_3$  solution by digitonin in MeOH-EtOH- $C_2HCl_3$  solution in presence of COMe<sub>2</sub> is recommended.

H. G. R.

**Dynamics of glutathione in disturbed circulation.** S. I. MALKIN, T. A. MAKAROVA, and W. S. SARBETEV (Z. ges. exp. Med., 1936, 97, 523—533).—In high altitudes the proportion of oxidised and total glutathione in venous blood increases.

A. G. P.

**Non-glucose reducing substances in blood. II. Vitamin-C fraction.** V. K. N. MENON (Indian J. Med. Res., 1935, 23, 447—454).—Ascorbic acid accounts for only 10—20% of the non-glucose reducing fraction of blood, which represents a mixture of several substances.

R. N. C.

**Water intake and blood-sugar level.** M. C. HRUBETZ (Proc. Soc. Exp. Biol. Med., 1937, 36, 420—422).—Restriction in H<sub>2</sub>O intake is associated with high blood-sugar.

H. G. R.

**Transpancreatic diathermy and regulation of the blood-sugar.** J. MICHEZ (Compt. rend. Soc. Biol., 1937, 125, 376—377).—The blood-sugar is decreased in the dog, particularly if secretion of adrenaline is prevented by ligaturing the adrenal veins.

H. G. R.

**Action of human saliva in increasing blood-sugar.** A. KORANYI, E. SZABLICS, and T. SZENES (Z. ges. exp. Med., 1936, 97, 508—513; Chem. Zentr., 1936, i, 3355).—Intravenous administration of the saliva to rabbits effected a temporary decrease followed by an increase in blood-sugar (max. at 35 min.). Insulin-induced hypoglycæmia is counteracted by saliva. Muscle weakening following the injection results from glycolysis.

A. G. P.

**Effect of sodium dithiodipentanedicarboxylate on experimental hyperglycæmia.** R. TOAFF (Arch. Farm. sperim., 1937, 63, 49—61).—Intramuscular injection of the salt (0.0065—0.0162 g.

per kg.) into rabbits lowers the fasting or alimentary hyperglycæmic blood-sugar.

F. O. H.

**Carbohydrate metabolism. I. Micro-electrometric determination of blood-sugar.** G. SANKARAN and K. RAJAGOPAL (Indian J. Med. Res., 1936, 24, 459—478).—The sugar content of 0.02 ml. or less of blood can be determined accurately by a modification of the method of Shaffer and Williams.

NUTR. ABS. (m)

**Determination of fermentable blood-sugar by measurement of carbon dioxide formed by the action of yeast.** R. F. HOLDON, jun. (J. Biol. Chem., 1937, 119, 347—368).—Rapid determinations of fermentable blood-sugar in 0.02 c.c. of blood can be made by measurement of CO<sub>2</sub> produced by yeast in Van Slyke's apparatus.

P. G. M.

**[Micro-]determination of blood-ketones.** R. H. BARNES (Proc. Soc. Exp. Biol. Med., 1937, 36, 352—353).

H. G. R.

**Relation between absorption of food and the alcohol content of the blood in man.** W. SCHWAGMEYER (Arch. exp. Path. Pharm., 1937, 185, 102—112).—Absorption of food decreases the EtOH concn. of blood. The decrease does not depend on the amount of food, which only causes a delay in excretion of EtOH, nor on its calorific content, but is caused by esterification of EtOH with degradation products of the food, particularly NH<sub>2</sub>-acids, and is therefore regulated to some extent by the digestibility of the food.

P. W. C.

**Blood-alcohol.** J. KOLLER (Deut. Z. ges. gerichtl. Med., 1936, 26, 234—241; Chem. Zentr., 1936, i, 3375).—Results of 661 determinations are recorded. The presence of Et<sub>2</sub>O interferes with the determination.

H. J. E.

**Blood-alcohol determination.** F. KUNKELE (Deut. Z. ges. gerichtl. Med., 1936, 26, 241—244; Chem. Zentr., 1936, i, 3375—3376).—The ratio of the EtOH content of the serum to the total EtOH content of the blood was 1.2 : 1.

H. J. E.

**Systematic errors in blood analysis. I. Data obtained after deproteinisation by Moog's method.** M. D. MEZINGCESCO (Bull. Soc. Chim. biol., 1937, 19, 109—112).—The sources are indicated for errors of 10—20% in vals. for urea-N etc. in blood filtrates after deproteinisation by CCl<sub>3</sub>·CO<sub>2</sub>H.

F. O. H.

**Biological phenomena of membranes. Distribution of sodium chloride and glucose between plasma and aqueous humour.** Y. DERRIEN, G. JAYLE, and P. FRIZET (Compt. rend. Soc. Biol., 1937, 125, 148—150).—The ratio of glucose in the aq. humour to that of the plasma is <1 and for NaCl is >1, the ratios being inversely related to one another.

H. G. R.

**Determination of corpuscle-/plasma-chloride ratio.** M. LÉVY and S. MIGNON (Bull. Soc. Chim. biol., 1937, 19, 234—243).—A criticism of the technique of Paisseau *et al.* (A., 1936, 1015).

A. L.

**Influence of anti-coagulants on the partition of chloride ions between plasma and corpuscles.** H. HIGOUNET (Bull. Soc. Chim. biol., 1937, 19, 53—

59).—NaF,  $K_2C_2O_4$ , or Na citrate decreases corpuscular vol., NaF and  $K_2C_2O_4$  producing a transport of  $H_2O$  and  $Cl'$  from corpuscles to plasma. With blood collected under oil, the partition of  $Cl'$  is unchanged whilst with blood in contact with the air, the plasma- $Cl'$  is  $>$  and  $<$  the normal val. with small and large amounts of anti-coagulant, respectively. Polymerised Na anethoedisulphonate affects neither corpuscular vol. nor partition of  $Cl'$ . F. O. H.

A synthetic anti-coagulating, anti-fermenting substance [for blood]. H. HICQUET (Compt. rend. Soc. Biol., 1937, **125**, 119—120).—Polymerised Na anethoedisulphonate suppresses the ionic exchanges of blood in contact with air (cf. preceding abstract). H. G. R.

Bromine content of blood. H. DOERING (Biochem. Z., 1937, **291**, 81—87; cf. A., 1937, **I**, 260).—The Br in 3 c.c. of blood is converted first into AgBr by the Carius method and then into  $ZnBr_2$  with Zn dust. The Br is then determined as previously described. For the determination of Br in serum and plasma org. matter is destroyed in an open vessel at  $100^\circ$  and the analysis is complete in 1 hr. 100 c.c. of human blood contain 0.2—0.4 mg. of Br. W. McC.

Colorimetric determination of potassium. A. M. ALEXEEVA (Bull. Biol. Méd. exp. U.R.S.S., 1936, **1**, 301—302).—The K of 0.5 ml. of serum is pptd. as  $K_4Co(NO_2)_6$ , the ppt. dissolved in dil.  $H_2SO_4$ , the Co converted into sulphite by addition of alkali sulphite, and the colour of the colloidal  $CoSO_3$  compared with that of a standard. NUTR. ABS. (m)

Calcium and potassium content of the blood, blood-plasma, and erythrocytes of the rabbit. J. LEBODA (Med. dosw. społ., 1936, **21**, 290—315).—The K contents of the blood, plasma, and red blood cells of rabbits are 126—229, 13—31, and 367—503 mg. per 100 ml. respectively. The corresponding vals. for Ca are 6.3—13.4, 9.8—18.9, and 2.7—7.3, respectively. NUTR. ABS. (m)

Comparison of the distribution of magnesium in blood cells and plasma of animals. D. F. EVELETH (J. Biol. Chem., 1937, **119**, 289—292).—Cattle are the only animals that usually show higher plasma- than cell-Mg. Sheep and goats have only a slightly higher cell-Mg. Low cell-Mg is confined to ruminants. P. G. M.

Determination of lead in whole blood. H. KRAFT-STROM, K. WULFERT, and O. SYDNES (Biochem. Z., 1937, **290**, 382—393).—A modification of the dithizone (I) method (cf. Willoughby *et al.*, A., 1935, 1094) is described for determination of small amounts ( $0.5$ — $10 \times 10^{-6}$  g.) of Pb in blood etc. ( $5$ — $10$  c.c.) in which the removal of Fe is unnecessary and all pptn. and filtration are avoided. Oxidative action of Fe is excluded by addition of  $Na_2S_2O_4$ . Pptn. of Fe is avoided by the presence of  $NH_4$  citrate and the Fe is converted into a stable complex by addition of KCN. (I) is extracted in  $N_2$ . The max. and mean scattering of results correspond with an accuracy of 6.5 and 3.8%, respectively. P. W. C.

Ratio of different phosphorus compounds in the blood and tissues during growth of rabbits. K. TAKAGI (Mitt. med. Akad. Kyoto, 1936, **18**, 617—675, 805—806).—The content of P compounds in the blood immediately after birth increases to a max. in 10 days, remains high for 2 months, and then decreases to steady vals. The amounts of  $PO_4'''$  in muscle, liver, and kidney are considerably  $>$  in blood and no regular variations in the contents are found. In blood and skeletal muscle the acid-sol.  $PO_4'''$ , in heart muscle, liver, and kidney the acid-insol.  $PO_4'''$ , predominates. At 2—3 months of age, when the food of the young is changing, variations in the amounts of acid-insol.  $PO_4'''$  are noted. NUTR. ABS. (m)

Effect of the boiler-makers' work on composition and properties of their blood. II. Acid-base balance of the blood. III. Lactic acid content of the blood. MEER S. MISCHKIS and MARIA S. MISCHKIS (Ukrain. Biochem. J., 1937, **10**, 23—35, 36—47; cf. A., 1936, 1530).—II. Towards the end of a day of heavy labour, the total  $CO_2$  of blood-plasma decreases, due to a decrease both in free  $CO_2$  and  $NaHCO_3$ . These decreases are approx. equal so that the  $p_H$  does not alter. The changes, due apparently to a primary alkali deficiency followed by a compensatory fall in the free  $CO_2$ , involve an alteration of the acid-base balance opposite in direction to that experienced during short spells of severe muscular exercise.

III. The lactic acid content of the blood at the end of the day is abnormally low, evidently due to more efficient removal of lactic acid in trained workers during prolonged heavy work. This alteration is opposite in direction to that experienced during short spells of severe exercise. W. O. K.

Diffusion in coagulated blood-serum. B. SERENY (Biochem. Z., 1937, **290**, 327—333).—Tables summarise the diffusion rates of various acids, alkalis, salts, and hæmoglobin in gels obtained by heat-coagulation of serum. P. W. C.

Variations in optical density and viscosity of serum on dilution with physiological solution. A. BOUTARIC and M. ROY (Bull. Soc. Chim. biol., 1937, **19**, 44—52).—Data for the changes in optical density and  $\eta$  on dilution of serum (horse) with 0.85% aq. NaCl indicate that no significant agglutination of colloidal constituents occurs. F. O. H.

Endocrinological serum-interferometry of normal and scorbutic guinea-pigs. L. RANDOIN and A. RAFFY (Bull. Soc. Chim. biol., 1937, **19**, 119—124).—No significant changes could be detected in the activity of pituitary, thyroid, adrenal, and testicular glands when the sera were examined by Hirsch's method (cf. Guillaumin, A., 1934, 428). F. O. H.

Comparison of the Wassermann reaction carried out on whole serum and on serum precipitated by hydrochloric acid. A. FANZERES and E. MORAIS (Compt. rend. Soc. Biol., 1937, **125**, 182—184).—The reaction is more sensitive if carried out on the serum after pptn. by HCl. H. G. R.

Hæmolytic power of saponins *in vitro* and their effect on the viscosity of blood-serum. L. MARCERON and H. C. DE MAUNY (Compt. rend.

Soc. Biol., 1937, 125, 349—350).—No correlation was observed between hæmolytic power and decrease in  $\eta$ .  
H. G. R.

Action of ozonised oxygen on the hæmolytic properties of sera. E. PEYRE and H. MORICOURT (Compt. rend. Soc. Biol., 1937, 125, 642—643).—On passing ozonised  $O_2$  through serum, the is decreased and the hæmolsin destroyed.  
H. G. R.

Spectrophotometry of hæmolysis. J. GUTMAN (Compt. rend. Soc. Biol., 1937, 125, 161—163).—The process of hæmolysis can be divided into two stages, the "incubation" when the complement is fixed by the red cells, and the hæmolysis proper, the amount of hæmoglobin liberated depending on the quantity and the speed with which the complement is adsorbed.  
H. G. R.

Occurrence in mammalian tissue of a lipid fraction acting as inhibitor of blood clotting. E. CHARGAFF (Science, 1937, 85, 548—549).—Cerebroside fractions obtained from the brain of sheep and pigs contain a substance which acts as inhibitor of the clotting of blood and plasma. A substance of similar activity has also been isolated from a crude lipin extract of the spinal cord of cattle. The purest preps. contain N and P, and only small amounts of S.  
L. S. T.

Activity coefficients of calcium and oxalate ions in plasma. Significance of concentration of calcium ions in blood clotting. R. NORDBO (Skand. Arch. Physiol., 1936, 75, Suppl. 11, 1—46).—An account is given of the determination of the coeff. and of the solubility of  $CaC_2O_4$  in salt solutions and in serum-ultra-filtrates. No relationship exists between clotting time and concn. of colloidal Ca, but the clotting time decreases as  $[Ca^{++}]$  increases. If plasma is left for 24 hr. at 1—3° with an amount of oxalate exactly equiv. to the total plasma-Ca, the concn. of diffusible Ca is not greatly altered owing to the solubility product of  $CaC_2O_4$  in plasma. Such plasma, after warming to 25°, clots in 8—10 hr. If an excess of oxalate amounting to 1 mg. per kg. of  $H_2O$  is added no clotting occurs after warming to 25°. Fibrinogen gave results similar to those obtained with plasma. Glycolysis appears not to be coincident with the first phase of clotting. The results show that a min.  $[Ca^{++}]$  in the plasma is necessary for clotting, and that the Ca-binding capacity of the plasma-proteins is unimportant. The combination of Ca with the plasma colloids which accompanies clotting is an attendant phenomenon and not a necessary condition. The results do not contradict the view that thrombin (I) is a colloidal Ca compound present in very low concn. and already in equilibrium with  $Ca^{++}$ . The necessary min.  $[Ca^{++}]$  required for clotting would then depend on the concn. of the colloid which together with Ca forms (I). The greater is the concn. of this colloid, the smaller is the  $[Ca^{++}]$  required.

NUTR. ABS. (m)

Alexin in the new-born. L. NATTAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt. rend. Soc. Biol., 1937, 125, 358—361).—Alexin is present only in small quantities in the serum of the new-born.

H. G. R.

Effect of ageing on the alexin content of human serum. L. NATTAN-LARRIER and L. GRIMARD (Compt. rend. Soc. Biol., 1937, 125, 512—515).—The resistance of human serum to ageing is approx. 30% of that of guinea-pig serum.  
H. G. R.

Precipitin reactions of ovalbumins. L. HEKTOEN and A. G. COLE (Proc. Soc. Exp. Biol. Med., 1937, 36, 97—99).—Chicken ovalbumin gives rise to a single sp. antibody, whilst the ovalbumins of the pearl guinea fowl and Amherst pheasant give rise to several antibodies.  
P. G. M.

Effect of pneumococcus type III specific polysaccharide on sedimentation of blood cells. W. J. NUNGESTER and L. F. KLEIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 315—317).—The sedimentation rate of citrated human blood is increased 58-fold by 0.3% of the sp. polysaccharide.  
P. G. M.

Chemo-specific flocculation of sterols by anti-sterol sera. A. J. WEIL and L. E. DEN D. DE JONG (Proc. Soc. Exp. Biol. Med., 1937, 36, 238—240).—By suitable immunisation, rabbit sera may be prepared which give sp. flocculation reactions with sols of cholesterol, dihydrocholesterol, and oxycholesterol respectively. Cross reactions observed are much less marked than the flocculations with homologous antigens.  
W. O. K.

Immunity and the virus-neutralising antibody. Passive immunity against vaccine virus. O. ANDERSEN (Z. Immunitats., 1937, 90, 207—218).—With partial immunity caused either by passive or active immunisation, a virus-neutralising antibody is present; the course of vaccination, however, is protracted in the first case and, owing to the presence of a further factor, accelerated in the second.

C. R. S.

Antigenic effect of purified typhoid autolysates giving negative protein reactions. E. KROGER (Z. Immunitats., 1937, 90, 223—228).—Old cultures of *B. typhosus*, deproteinised with  $FeCl_3$ , tannic acid, or  $Fe(OH)_3$ , give agglutinin and/or precipitin reactions. Hence biologically active proteins which cannot be detected by chemical reagents are present.

C. R. S.

Change in immunising power of typhoid bacilli in a medium containing homologous immune sera and the formation of a new variety. T. TAKANO (Z. Immunitats., 1937, 90, 229—234).—Different forms of *B. typhosus* were kept for 7 years in a broth containing homologous immune sera. A variety rich in  $\beta$ -sp. receptors was thus produced.

C. R. S.

Relation between the formation of agglutinins and the intermediary metabolism of fat and carbohydrates. S. LAJOS (Z. Immunitats., 1937, 90, 261—270).—After intravenous injection of killed typhoid bacilli into rabbits, the liver-lipins increase and the carbohydrates decrease whilst the blood-lipins (except phosphatides) diminish. Similar changes occur after the injection of NaF, alone or with killed typhoid bacilli. Injection of the bacilli occasionally diminishes the agglutinin titre whilst treatment with NaF and typhoid vaccine produces a subnormal formation of antibodies.

C. R. S.

**Type-specificity of heat-extractive antigens.**  
**II. Formation of antibodies in the lungs by means of the intrapulmonary injection of coccigens, especially of tubercular antibodies.** R. TORIKATA and H. FUKUTOMI (Z. Immunitats., 1937, 90, 247—256).—The injection of aq. extracts of *B. tuberculosis* and of *B. coli* produced antigens which could be detected locally and later in the blood, and produced homologous and heterologous immunisation.  
 C. R. S.

**Chemical and immunological mechanism of the infection and immunity by anthrax. I. Chemical structure of the capsular substance of *Bacillus anthracis* and of the serologically identical specific substance of *Bacillus mesentericus*.** G. IVANOVICS and V. BRUCKNER (Z. Immunitats., 1937, 90, 304—318).—The haptens of the membranes of *B. anthracis* and *B. mesentericus* are serologically and chemically identical, hydrolysis (HCl) indicating a polypeptide consisting only of l-glutamic acid.  
 C. R. S.

**Stability of absorbed immune sera for the M-N-diagnosis of blood groups.** S. OLBRICH (Z. Immunitats., 1937, 90, 271—286).—Absorption preps. of the sera, even when dried, remain active for 2 years.  
 C. R. S.

**Anti-gonadotropic sera.** R. DEMANCHE, G. LAROCHE, and H. SIMONNET (Compt. rend. Soc. Biol., 1937, 125, 112—113).—The anti-gonadotropic action of rabbit's serum is not accompanied by sensitising properties capable of fixation of the complement.  
 H. G. R.

**Effect of ageing on the anti-complementary power of human serum.** L. NATAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt. rend. Soc. Biol., 1937, 125, 113—115).—The anti-complementary power developed after a few days' storage at 5° and persisted for 2 years. Heating to 56—57° and 60—62° caused loss of this power in 55.6% and 62.5% of the samples, respectively.  
 H. G. R.

**Combined action of heat and ageing on the anti-complementary power.** L. NATAN-LARRIER and L. GRIMARD (Compt. rend. Soc. Biol., 1937, 125, 116—118).—The anti-complementary power either does not develop, or is rapidly lost on storage at 5°, in sera which have been heated to 56—57°.  
 H. G. R.

**Production of staphylococcus antitoxin from anatoxins of different antigenic power.** P. NÉLIS (Compt. rend. Soc. Biol., 1937, 125, 128—130).—An anatoxin, apparently inactive by flocculation or fixation methods, produces an appreciable quantity of antitoxin in the rabbit.  
 H. G. R.

**Influence of anatoxins on blood composition.** W. DE WEERDT (Ann. Soc. Sci. Bruxelles, 1937, [ii], 57, 138—158).—Staphylococcus, diphtheria, and tetanus anatoxins when injected into the rabbit produce an anaemia with a tendency to spontaneous remission. Staphylococcus anatoxin also causes a large increase in no. of leucocytes, whilst the others have practically no leucogenic action.  
 J. N. A.

**Antigens of anthrax bacteria.** W. SCHAEFFER and G. SANDOR (Compt. rend. Soc. Biol., 1937, 125,

336—338).—An antigen similar to that from the anthrax capsule is present in certain mucous strains of *B. mesentericus*, whilst the somatic antigen from the anthrax bacterium itself is sp.  
 H. G. R.

**Antigen O and the specific human antigen.** P. MOUREAU (Compt. rend. Soc. Biol., 1937, 125, 366—367).—These antigens are not identical.  
 H. G. R.

**Adsorption of antigens by antibodies or vice versa. I, II.** B. N. GHOSH (Indian J. Med. Res., 1935, 23, 285—303, 837—846).—Theoretical.  
 R. N. C.

**Serological constitution of ox serum and agglutinin O.** P. MOUREAU (Compt. rend. Soc. Biol., 1937, 125, 367—368).—Antigen O is not identical with the heterogenic antigen of sheep erythrocytes.  
 H. G. R.

**Sensitisation of guinea-pigs with heterogenic lipins together with a suspension of carbon particles, and ineffective attempts at auto-sensitisation with the animal's own lipins.** P. E. MARTIN and E. RECEVEUR (Compt. rend. Soc. Biol., 1937, 125, 663—665).  
 H. G. R.

**Phosphorescent minerals of the bony tissues of frogs (*Rana esculenta*, L.).** G. BROOKS (Compt. rend., 1937, 204, 1447—1448).—The phosphorescence of the ashed tissue under ultra-violet light is due to small amounts of Mn and Zn.  
 E. M. W.

**Solubility of bone salt.**—See A., I, 412.

**Chemical composition of human teeth. Effect of physiological stimuli.** M. L. LE FEVRE and H. C. HODGE (Dent. Cosmos, 1936, 78, 1119—1124).—Compared with those on the right side, the teeth on the left of the lower jaw of a patient who chewed exclusively on the left side of the mouth contained less inorg. matter and Ca, had a higher residue solution no., and absorbed less X-rays. Assuming that the teeth of the left side maintained an abnormally high blood flow, these findings are consistent with the concept that calcification occurs best in tissues of low blood supply.  
 NUTR. ABS. (m)

**Spectrum analysis of dental tissue for "trace" elements.** W. F. DREA (J. Dent. Res., 1936, 15, 403—406).—Traces of Al, Ba, Cu, Fe, Pb, Si, Ag, Sr, Ti, V, and Zn and larger amounts of Ca, Mg, P, and Na occur in human dentine and enamel and C occurs in dentine. The dentine contains F, and the enamel also when the drinking water contains 2 p.p.m. of F. Some teeth contain Cr, Li, Mn, and K.  
 NUTR. ABS. (m)

**Spectrographic analysis of thyroid glands.** N. K. DE (Indian J. Med. Res., 1935, 23, 501—504).—Rat thyroids contain Al, Ca, Cu, Fe, Pb, Mg, Mn, K, P, Na, and Si; Ag and Zn are also present in some. The distribution of the metals is unaffected by the diets supplied to the animals.  
 R. N. C.

**Variation in weight and water and potassium contents of the nervous system at birth and in adults.** A. LEULIER and A. BERNARD (Bull. Soc. Chim. biol., 1937, 19, 664—670).—Tables summarise the wt., H<sub>2</sub>O content, and K distribution in various parts of the nervous system of rabbit, cat, and guinea-pig at birth and at various ages.  
 P. W. C.

**Chlorine in biological substances.** E. KAHANE (Bull. Soc. Chim. biol., 1937, 19, 720—730).—It is shown by dialysis, electrodialysis, extraction with EtOH-COMe<sub>2</sub>, and treatment directly with AgNO<sub>3</sub> that the whole of the Cl of normal tissues, organs, and excretions behaves as Cl<sup>-</sup> ion. P. W. C.

**Mineral matter of feathers and the normal phosphorus : calcium ratio.** R. SALGUES (Compt. rend. Soc. Biol., 1937, 125, 124—125; cf. this vol., 172).—With birds on a carnivorous diet, a decrease in the ash content with an increase in P occurs. The S content decreases with the age of the feathers and the P : Ca ratio is >1, whilst on a vegetable diet it is <1. H. G. R.

**Isolation of amino-acids from human hair.** P. S. YANG and C. T. CHENG (J. Chinese Chem. Soc., 1937, 5, 96—99).—Human hair treated with hot 1% Na<sub>2</sub>CO<sub>3</sub> and hydrolysed with 20% HCl gives yields of *l*-cystine only and of *l*-tyrosine  $\frac{2}{3}$ , of those from untreated hair. Fischer's ester method of separation is inapplicable. A. L.

**Nitrogenous constituents of the jellyfish *Cyanea capillata*.** M. MOHR (Z. Biol., 1937, 98, 120—124).—Glycine, betaine, *d*-arginine, and NMe<sub>3</sub>O were isolated and colour and pptn. reactions indicated the presence of many other N compounds. W. McC.

**Crystallisation of liver fraction protecting against necrosis from carbon tetrachloride or chloroform administration.** J. C. FORBES and J. S. McCONNEL (Proc. Soc. Exp. Biol. Med., 1937, 36, 359—360).—The cryst. material (cf. this vol., 64) is probably a purine derivative. H. G. R.

**Synthesis of octopine (pectenine).** J. L. IRVIN and D. W. WILSON (Proc. Soc. Exp. Biol. Med., 1937, 36, 398—399).—Octopine is  $\alpha$ -carboxydimethyl-amino- $\delta$ -guanidinovaleic acid, m.p. 257—260° [picrate, m.p. 219° (decomp.)]. H. G. R.

**Glutamic acid-pyrrolidonecarboxylic acid system.**—See A., I, 411. N. M. D.

**Determination of pentoses in adenylic nucleotides.** J. K. PARNAS and B. UMSCHWEIF (Bull. Soc. Chim. biol., 1937, 19, 325—335).—The pentose in the material is converted into furfuraldehyde by the prescribed method and determined colorimetrically. A. L.

**Fats of "Russian" cantharides (*Lytta vesicatoria*, Fb.).** M. M. JANOT and P. FAUDEMAY (Bull. Soc. chim., 1937, [v], 4, 1149—1151).—The light petroleum extract from these insects contains principally palmitic and oleic acids, with linoleic, stearic, and linolenic acids (largely free), cholesterol and another (unidentified) sterol, C<sub>21</sub>H<sub>44</sub>, and another hydrocarbon. E. W. W.

**Phospholipins as oxygen carriers.** W. R. BLOOR and R. H. SNIDER (Proc. Soc. Exp. Biol. Med., 1937, 36, 215—217).—A buffered suspension (*p*<sub>H</sub> 5—8) of purified liver- or muscle-phospholipins (I) had no significant oxidising effect on reduced methylene-blue (II), but, after oxidation in air for 24—48 hr., the (I) became sol. in H<sub>2</sub>O and markedly reduced (II). W. O. K.

U\* (A., III.)

**Histo-physiology of pulmonary lipins. Digestive cycle of pulmonary lipins in the dog.** L. BNET, J. VERNE, and J. L. PARROT (Compt. rend. Soc. Biol., 1937, 125, 121—123).—Three stages were observed: the appearance of sudanophilic corpuscles in the bronchial epithelium, an increase in the lipin inclusions of the round cells, and an overloading of these cells and those of the bronchial epithelium with substances stained by the Feulgen-Verne method. H. G. R.

**Adipocere of a fowl.** J. F. DURAND and P. VIÈLES (Bull. Soc. Chim. biol., 1937, 19, 336—341).—The adipocere contained 80—90% of insol., unsaturated OH-acids together with small quantities of glycerol and cholesterol. A. L.

**Liberation of combined porphyrin by photolysis.** J. THOMAS (Compt. rend. Soc. Biol., 1937, 125, 386—388).—Irradiation of tissue with ultraviolet light after treatment with dil. HCl liberates combined porphyrin. H. G. R.

**Physico-chemical conditions for rendering crystallin opaque.** P. REISS, J. NORDMANN, and C. REISS (Compt. rend. Soc. Biol., 1937, 125, 464—466).—Max. opacity is produced in the presence of oxidising agents at *p*<sub>H</sub> 5—6. H. G. R.

**Composition of cocoon-silk of *Eriogyna pyretorum* and *Theophila mandalina*. I. Inorganic constituents and nitrogen distribution.** R. INOUE and A. MATSUURA (Bull. Sericult., 1937, 9, 177—183).—The cocoons have the following respective % compositions: H<sub>2</sub>O 11.45, 10.12; ash 1.50, 0.86; total N 19.32, 19.01; amide-N 0.40, 0.56; arginine-N 1.20, 1.01; cystine-N 0.03, 0.18; NH<sub>2</sub>-N 0.35, 0.61; histidine-N 0.44, 0.54; lysine-N 0.035, 0.09; total (NH<sub>2</sub>)<sub>1</sub>-acid-N 12.83, 11.78; non-NH<sub>2</sub>-N 2.89, 1.53. The ash consists mainly of SiO<sub>2</sub>, CaO, K<sub>2</sub>O + Na<sub>2</sub>O, P<sub>2</sub>O<sub>5</sub>, and SO<sub>3</sub>. F. O. H.

**Glycoproteins. III. Polysaccharides from pig's gastric mucosa.** K. MEYER, E. M. SMYTH, and J. W. PALMER (J. Biol. Chem., 1937, 119, 73—84; cf. A., 1936, 1138).—Commercial pig gastric mucin contains a neutral polysaccharide consisting of acetylglucosamine (I) and galactose (1 : 1), and an acid polysaccharide containing (I), hexuronic acid, and ester sulphate. The former preponderates and is responsible for the very viscous nature of the mucin. It gives a blood group A reaction in amounts of 5—10 × 10<sup>-10</sup> g. J. N. A.

**Liver proteins. II. Albumin.** J. M. LUCK and D. MARTIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 320—321).—Extraction of dog liver at *p*<sub>H</sub> 4.7—7.0 with aq. NaCl yielded 2.2% of albumin. When 0.5*M*-(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> was used both the albumin and total salt-sol. protein increased up to *p*<sub>H</sub> 6.3 and then remained const. (approx. 3.4 and 10.3% respectively). P. G. M.

**Plasma of smooth muscle. Method of treatment with acetone at low temperatures.** C. ACHARD and M. PIETTRE (Compt. rend., 1937, 204, 1145—1147).—The plasma (from muscle of alimentary canal), *p*<sub>H</sub> 6.95, yields on fractionation with COMe<sub>2</sub>, two globulins (1.58, 0.95), albumin (0.88), NH<sub>2</sub>-acids, polypeptides, Cl<sup>-</sup> (0.23—0.28 as NaCl), inorg.

P (0.07—0.095), K (0.18—0.197), Na (0.10—0.12%), and only traces of lipins and carbohydrates.

F. O. H.

**Sulphites as protein precipitants.** W. R. CAMPBELL and M. I. HANNA (J. Biol. Chem., 1937, **119**, 9—14).—Using dil. human serum or plasma, complete saturation with  $(\text{NH}_4)_2\text{SO}_3$  or  $\text{NH}_4\text{HSO}_3$  pptts. all the proteins. With serum,  $\text{K}_2\text{SO}_3$  causes slight pptn.  $\text{Li}_2\text{SO}_3$  pptts. much protein, but at room temp. globulin pptn. is incomplete. Sulphites of Pb, Al, and Zn produce pptts. of globulins which rapidly denature. Saturated  $\text{Na}_2\text{SO}_3$  and  $\text{NaHSO}_3$  salt out serum-globulins, but pptn. of albumin is incomplete at room temp.  $\text{Na}_2\text{SO}_3$  is the best for use with plasma.

J. N. A.

**Effect of urea on the degree of hydration of proteins.** F. HEIM (Biochem. Z., 1937, **291**, 88—98).—The amount of NaCl required to ppt. fibrinogen (I) from solution in physiological aq. NaCl is increased by addition of urea in concns.  $< 0.25M$ ,  $\eta$  of the (I) solutions being increased. Urea also increases  $\eta$  of gelatin solutions and, in sufficient concn., delays or prevents coagulation of blood. These results are explained by supposing that the degree of hydration of proteins is increased by urea.

W. McC.

**Polarisation optics and minute structure of coagulated fibrin.** M. F. VON DUNGERN (Z. Biol., 1937, **98**, 136—150).—Threads of coagulated fibrin show double refraction, positive with reference to their length and equal to  $4.1 \times 10^{-3}$  for air-dried threads. The sp. double refraction is  $1.5\text{--}2.0 \times 10^{-3}$ ,  $n$  1.54. Refraction and dichroic staining with trypan-blue indicate a structure of rod-like micelles. Similar phenomena occur with reticular coagula. The bearing of the data on the coagulation process is discussed.

F. O. H.

**Constituents of hydrochloric acid hydrolysates of elastin.**—See A., II, 357.

**Cyclol theory and the "globular" proteins.** D. M. WRINCH (Nature, 1937, **139**, 972—973).—A summary.

L. S. T.

**Colloid reactions and biological experiments with colloidal tungstic oxide.**—See A., I, 410.

N. M. D.

**Permeability of membranes. V. Origin of bioelectric currents.**—See A., I, 408.

N. M. D.

**Complete permeability of all the tissues, including the skin, of the frog to alcohol.** M. NICLOUX (Compt. rend. Soc. Biol., 1937, **125**, 453—456).

H. G. R.

**Cytochromes. IV. Hæmatins-C and their combination with globin.** J. ROCHE and M. T. BENEVENT (Bull. Soc. Chim. biol., 1937, **19**, 642—648).—Various products grouped as hæmatins-C [e.g., hæmatin of cytochrome-C, the derivative (I) obtained by successive oxidation and reduction of protohæmatin in  $\text{C}_5\text{H}_5\text{N}$ , the condensation products of the latter with glycine or  $\text{C}_5\text{H}_5\text{N}$  of Zeile and Piutti (A., 1933, 959)] all give  $\text{C}_5\text{H}_5\text{N}$ -hæmochromogens having the same spectrophotometric behaviour and, with the exception of (I), combine with globin to give methæmoglobin (cf. this vol. 9).

P. W. C.

**Flavin content of different organs of the eel.** M. FONTAINE (Compt. rend., 1937, **204**, 1367—1368).—The total flavin content of the eel, determined by Gourevitch's method (this vol., 209), increases with age from 1.8 to  $5.1 \times 10^{-4}\%$ . Blood and muscle contain  $< 1$ , spleen 2—3, gills 3—4, heart 4—5.4, kidney 5, ovary 5.3—6, liver 7.5—10, and skin from the back  $17\text{--}26 \times 10^{-4}\%$ .

J. L. D.

**Determination of flavin in invertebrates.** A. GOUREVITCH (Bull. Soc. Chim. biol., 1937, **19**, 125—129).—The flavin content of parasites (e.g., *Ascaris*) was determined by measurements of fluorescence-excitatory power (cf. Karrer and Fritzsche, A., 1935, 1134).

F. O. H.

**Constitution of toxoflavin.**—See A., II, 351.

**Specificity of lactoflavin.**—See A., II, 352.

**Carotenoid pigments in organs of fishes. Carotenoid substances in cephalopods.** E. LÖNNBERG (Ark. Zool., 1936, **28**, A, No. 15, pp. 7; **28**, B, No. 8, pp. 4).—(A) The eyes of certain fishes previously believed to contain no carotenoid pigments contain small amounts of xanthophyll. The blood of selachians appears to be very poor in carotenoids; the blood of teleosts contains the same xanthophyll-like pigments as do the eyes. Notes on the carotenoids in the liver of some teleosts are included.

(B) The eyes of *Sepioloa scandica*, *Rossia macrosoma*, and *Eledone cirrosa*, and the liver of the last contain pigments with spectral absorption resembling that of xanthophylls. These pigments appear to be the same as those of the eyes of fishes.

NUTR. ABS. (m)

**Pigments and vitamin content of yolk of egg.** F. BILEK (Wiss. Ber. VI Weltgeflügelkongr., 1936, **1**, 233—236).—The colour of the yolks of hens' eggs depends on the amount of pigment in the food (especially yellow maize, carrots, or lucerne meal). The vitamin-A content of the yolk  $\propto$  the amount of pigment and the amount of cholesterol increases with increasing depth of colour.

NUTR. ABS. (m)

**Pigments of the retina.** O. BRUNNER (Österr. Chem.-Ztg., 1937, **40**, 203—207).—The role played by vitamins, visual purple, and pigments of the retina (cf. A., 1936, 1287) in the visual processes is discussed.

F. O. H.

**Pigments associated with the fatty tissues of plants and animals.** I. M. HEILBRON (Proc. Roy. Inst., 1937, **29**, 531—547).—A lecture.

**Indian snake venoms. I. Daboia venom: its chemical composition, protein fractions, and their physiological action.** S. N. GANGULY and M. T. MALKANA (Indian J. Med. Res., 1936, **23**, 997—1006).—The venom contains C, H, O, N, and S, but not P. Protein-N in the dried venom indicates 96.8% of protein;  $\text{Et}_2\text{O}$  extracts 2.8% of sol. lipins. The proteins consist of globulin (23.35%), albumin (22.12%), and proteoses (I) (50.52%); the secondary (I) are considered to be responsible for the neurotoxic, coagulant, and hæmorrhagic actions of the venom. Adsorption methods and pptn. with  $(\text{NH}_4)_2\text{SO}_4$  or  $\text{COMe}_2$  do not separate the fractions responsible for the above actions.

R. N. C.

**Protein nature of bee- and *Crotalus*-poisons.** I. R. HAVEMANN and K. WOLFF (Biochem. Z., 1937, 290, 354—359; cf. this vol., 9).—The amphoteric nature of the toxin (apitoxin) (I) and rattlesnake venom (crotalotoxin) (II) is indicated by cataphoresis. The isoelectric points of (I) and (II) are  $p_H$  8.7 and 7.9, respectively. (I) is difficultly sol. at  $p_H > 8.3$  and (II) is only slightly sol. in the region of its isoelectric point. Both (I) and (II) dialyse readily through collodion and parchment membranes. P. W. C.

**Scorpion toxin.** C. TETSCH and K. WOLFF (Biochem. Z., 1937, 290, 394—397).—36.5 mg. of a colourless, highly toxic substance (S 3.8%, N 13.6%) is isolated as the hydrochloride from 150 scorpion stings. The substance appears in composition to be related to bee and snake poisons. P. W. C.

**Nature of cerebrospinal fluid.** Y. DERRIEN (Bull. Soc. Chim. biol., 1937, 19, 649—663).—More detailed results confirm that the blood-cerebrospinal fluid equilibrium obeys Derrien's and not Donnan's law (cf. this vol., 54). P. W. C.

**Determination of protein in cerebrospinal fluid.** J. HEMPEL and L. GIESE (Klin. Woch., 1936, 15, 1648—1649).—The method is based on the production of EtOH albuminates by treatment with different concns. of EtOH and subsequent measurement of the turbidity in a nephelometer. Normal fluid contains on the average 23 mg. of total protein per 100 ml. with a globulin:albumin ratio of 0.24. In untreated paralysis the vals. are 55 and 1.3, respectively, and in purulent meningitis 103 and 0.24. NUTR. ABS. (m)

**Micro-determination of phosphorus in cerebrospinal fluid.** C. TROPP, O. SEUBERLING, and B. ECKARDT (Biochem. Z., 1937, 290, 320—326).—Methods are described for the determination of inorg., total, acid-sol., and lipin-P in cerebrospinal fluid and a table summarises the results in 10 patients. P. W. C.

**Ionic equilibrium in milk.** L. HABERS and H. J. C. TENDELOO (Proc. 5th Int. Cong. Tech. Chem. Agric. Ind., Holland, 1937, II, 285—290).—Potentiometric titration of skim-milk with NaOH and  $\text{Ca}(\text{OH})_2$  shows that more equivs. of the latter are required to reach the same  $p_H$  as the former. The addition of a neutral salt to milk increases the real and titratable acidity; with low concns. of the salt more  $\text{Ca}(\text{OH})_2$  than NaOH is required to reach a certain  $p_H$  but this difference vanishes with higher salt concns. Pptn. of Ca by  $\text{C}_2\text{O}_4^{2-}$  shows a smaller difference between the titration with NaOH and  $\text{Ca}(\text{OH})_2$ . The casein-phosphate complex is discussed. W. L. D.

**Zeolites as analytical reagents for the examination of milk cations.** W. L. DAVIES (Proc. 5th Int. Cong. Tech. Chem. Agric. Ind., Holland, 1937, II, 291—296).— $\text{Ca}^{++}$  in milk can be rapidly determined by the base-exchange method. Ca exchange in milk occurs in two phases, a rapid exchange of  $\text{Ca}^{++}$  and a slow exchange of Ca liberated from complex combination by the disturbance of the  $\text{Ca}^{++}$ /combined Ca equilibrium. The appropriate zeolitic cations to use are those which do not interfere with the reaction of the milk during the exchanging process ( $\text{Mn}^{++}$ ,

$\text{Ba}^{++}$ ,  $\text{NH}_4^+$ ). Partial pptn. of milk-Ca with  $\text{C}_2\text{O}_4^{2-}$  is distributed between ionic and combined forms. 20% of small amounts of  $\text{Ca}^{++}$  added to milk enters into the combined form. Increase in milk acidity increases  $\text{Ca}^{++}$  and the rate of Ca exchange from the combined form, whilst increased alkalinity has the reverse effect except where the alkalinity is due to ions entering from alkali zeolites. W. L. D.

**Source of the typical components of milk fats. Hypothesis suggested by recent work on their glyceride structure.** T. P. HILDITCH (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, II, 367—383).—Depot fats of animals contain a const. amount of palmitic (30%) but varying amounts (7—30%) of stearic acid and fully saturated glycerides of stearic acid. Milk fats contain lower saturated fatty acids but have a const. palmitic and varying oleic acid content. When pig depot fat is hydrogenated, saturation of palmito-oleo- or trioleo-glycerides appears to occur. In milk secretion preformed oleo-glycerides are, in part, converted into lower saturated fatty acid and stearic glycerides. This is based on the fact that both  $\omega$ - and  $\beta$ -oxidation-reduction processes are possible with fats, and that small quantities of unsaturated acids of the  $\text{C}_{10}$ — $\text{C}_{16}$  type with the double linking at 9:10 occur as fragments of transformed oleo-glycerides. The enzymic oxidation-reduction system would be interfered with if other reactive compounds are selectively adsorbed by the enzyme. Feeding of cod-liver oil, containing unsaturated  $\text{C}_{20}$  and  $\text{C}_{22}$  acids, to cows results in a diminished yield of milk fat and a gross alteration in fatty acid distribution owing to the disturbance of the normal oleo-glyceride breakdown by the presence of  $\text{C}_{20}$  and  $\text{C}_{22}$  acids. Such an interference is absent when feeding rape and linseed oils. W. L. D.

**Protein fractions, casein and soluble albumin, in human milk: effect of fat on casein precipitation.** A. BIEBER (Riv. Clin. pediat., 1936, 34, 866—881).—The proportion of casein to other proteins does not alter during the course of lactation. NUTR. ABS. (m)

**Determination of ammonia in milk.** S. NIEMCZYCKI and K. GERHARDT (Lait, 1936, 16, 1049—1061).—The  $\text{NH}_3$  content of cow's milk is best determined by the method of Parnas (A., 1925, i, 323) for blood- $\text{NH}_3$ . The average val. is 0.75 mg. of  $\text{NH}_3$  per litre of fresh milk (range 0—2.18 mg.). The  $\text{NH}_3$  content of milk increases as a result of bacterial proteolysis, and hence is an important indicator of quality. NUTR. ABS. (m)

**Elimination of nickel in the bile.** F. CAUJOLLE (Bull. Soc. Chim. biol., 1937, 19, 342—352).—The elimination of Ni in the bile of dogs injected with aq.  $\text{NiCl}_2$  under chloralose anaesthesia is  $<$  that of Co under analogous conditions (A., 1936, 1415). A. L.

**Destruction of digitalis substances by gastric juice.** I. F. ŠVEC (Arch. exp. Path. Pharm., 1937, 185, 57—70).—Almost complete destruction of digitalis substances occurs in HCl solution at  $p_H$  1.25 and in gastric juice, the latter reaction being dependent on  $p_H$  and on the colloid content but being independent of the pepsin content. P. W. C.

**Pituitary control of alimentary blood flow and secretion.** (A) Changes in stomach produced by administration of posterior pituitary extract. E. C. DODDS, R. L. NOBLE, R. W. SCARFF, and P. C. WILLIAMS. (B) Effect of posterior pituitary extract on alimentary secretions of intact animals. (C) Effect of alterations in blood flow on gastric secretion. (D) Gastric secretion and blood flow in hypophysectomised animals. W. C. CUTTING, E. C. DODDS, R. L. NOBLE, and P. C. WILLIAMS (Proc. Roy. Soc., 1937, B, 123, 22—26, 27—38, 39—48, 49—59; cf. A., 1935, 902).—(A) Injection of a posterior pituitary extract produces a severe lesion in the acid-bearing area of the stomach of rabbits and other animals. A similar lesion is produced by  $\text{BaCl}_2$ .

(B) Stimulation of gastric secretion in cats, produced by histamine, insulin, sham feeding, or pilocarpine, is inhibited by the vasopressor fraction of posterior pituitary extract and by other vasoconstrictors. The vol. but not the acidity of the juice is reduced.

(C) Gastric secretion is dependent on (a) stimulus and (b) an adequate blood flow to the stomach, but is not induced by either factor alone.

(D) In hypophysectomised animals the gastric secretion and blood flow differ markedly from the normal and the acid-vol. relationship is destroyed. A substance, secreted in the posterior lobe, essential for the normal regulation of secretion is indicated.

E. M. W.

**Effect of various degrees of anoxæmia on secretion of acid and chlorides by the stomach.** C. K. SLEETH and E. J. VAN LIERE (Proc. Soc. Exp. Biol. Med., 1937, 36, 208—211).—In barbitalsed dogs and cats, anoxæmia reduces the gastric secretion of acid and  $\text{Cl}'$ , only when it is more intense than that produced by breathing air with an  $\text{O}_2$  partial pressure of 53 mm. Hg.

W. O. K.

**Hæmatological studies in Indians. IV. Fractional gastric analyses in normal Indians.** L. E. NAPIER and C. R. DAS GUPTA (Indian J. Med. Res., 1935, 23, 455—462).—Gastric acidity is generally > in normal Europeans, and achlorhydria is rarer. Acidity in males is > in females. R. N. C.

**Determination of calcium in urine and fæces by Aron's method.** G. HAMMARSTEN (Skand. Arch. Physiol., 1936, 75, 189—194).—Aron's method (A., 1907, ii, 652) is applicable to the determination of Ca in the urine and fæces of rats in metabolism experiments. The presence of significant amounts of Si vitiates the results and the correct proportions of  $\text{H}_2\text{SO}_4$ ,  $\text{H}_2\text{O}$ , and  $\text{EtOH}$  must be used. Org. matter of the fæces and urine is first destroyed with  $\text{H}_2\text{SO}_4$  and  $\text{HNO}_3$ .

NUTR. ABS. (m)

**Treatment of urinary infection: importance of dietary control.** H. I. COOMBS, C. H. CATLIN, and D. READER (Lancet, 1937, 232, 1043—1046).—Urine can be rendered and maintained relatively alkaline or acid by administration of suitable diets. Acid- and alkali-producing foods are tabulated.

L. S. T.

**Treatment of urinary infections with calcium mandelate.** E. SCHNOHR (Lancet, 1937, 232,

1104—1105).—Treatment with Ca mandelate is as effective as those with other preps. of the acid.

L. S. T.

**Sugar content of normal urine and its relation to normal blood-sugar.** K. N. BAGCHI and M. N. RUDRA (J. Indian Med. Assoc., 1936, 6, 130—134).—The following average vals. (mg. per 100 ml.) for blood- (I) and urine-sugar (II) were found: Bengalees 104, 85; Biharis 118, 93; Oriyas, 123, 90; Hindus 113, 89; non-Hindus (non-vegetarian) 104, 87; vegetarians (Hindus) 123, 93; non-vegetarians 110, 88. There was a correlation between (I) and (II) but not between age and (I) or (II).

NUTR. ABS. (m)

**Creatine and creatinine excretion in infancy.** R. CATHERWOOD and G. STEARNS (J. Biol. Chem., 1937, 119, 201—214).—The urinary vals. are statistically correlated with body-wt., length, and age. The data support the conclusions that exogenous sources are without consistent influences on either substance, that creatinine excretion is almost exactly a function of the muscular tissue-wt., whilst creatine excretion depends mainly on the metabolic rate. The creatine vals. are the lower and the more irregular.

R. M. M. O.

**Determination of porphyrin [in urine] with the Leifo photometer.** K. FRANKE (Z. ges. exp. Med., 1936, 97, 616—621; Chem. Zentr., 1936, i, 3551).—Exact determinations of  $2.5\text{--}250 \times 10^{-6}$  g. per 100 c.c. can be made by means of calibration curves. The extraction of porphyrin from urine is described.

H. J. E.

**Spectrographic examination of urinary and biliary calculi.** S. RANGANATHAN and N. K. DE (Indian J. Med. Res., 1935, 23, 237—238).—Stones from different species show the spectra of a no. of elements, mostly metallic.

R. N. C.

**Solubility of aragonite in salt solutions.**—See A., I, 407.

N. M. D.

**Humoral medicine and chemistry.** A. LUMIERE (XIV Congr. Chim. ind., 1934, Comm. 2, 15 pp.; Chem. Zentr., 1936, i, 3363).—A "neo-humoral pathology" is developed on the basis of colloid science.

H. N. R.

**Blood- and urinary amylase in man.** S. H. GRAY and M. SOMOGYI (Proc. Soc. Exp. Biol. Med., 1937, 36, 253—255).—In normal subjects the urine-: blood-amylase ratio is 2—6:1. The ratio is unaltered in acute pancreatitis although the abs. vals. increase; it may be reversed in kidney disturbances such as often occur in scarlet fever.

P. G. M.

**Influence of gastric acidity and degree of anæmia on iron retention.** A. P. BARER and W. M. FOWLER (Arch. Int. Med., 1937, 59, 785—792).—Achlorhydria decreases the retention of Fe when dietary intakes of Fe are normal but not when large doses of Fe are orally administered. The retention is not increased by addition of  $\text{HCl}$  to the diet nor influenced by anæmia. A dietary intake of 6.7 mg. of Fe per day gives a negative Fe balance in anæmic patients.

F. O. H.

**Tryptophan and histidine in the blood in Biermer's anæmia.** Amino-acids in the blood in Biermer's anæmia or anæmia following

**hæmorrhage.** L. TOCHOWIOZ (*Folia hæmatol.*, 1936, 56, 240—248, 249—268).—Data are given on the tryptophan and histidine content of normal serum and serum of pernicious and post-hæmorrhagic anæmia cases, fasting or following administration of peptone, beef, or liver-protein. NUTR. ABS. (m)

**Detection of Castle's enzyme in gastric juice of adults and children.** E. L. RAUSCHENBERGER (*Z. ges. exp. Med.*, 1936, 97, 514—522; *Chem. Zentr.*, 1936, i, 3350).—The enzyme is detected by its effect on the reticulocyte count in rats. It is absent from the gastric juice in pernicious anæmia. Concn. of the juice activates the enzyme. A. G. P.

**Cobalt content of iron compounds and its possible relation to anæmia.** E. J. UNDERWOOD (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 296—299).—Common sources of Fe contain up to 119 p.p.m. of Co. This may be significant in Fe therapy of anæmia. P. G. M.

**Effect of pancreatic tissue extract on cholesterol of blood in cardiovascular arteriosclerosis.** A. SAMUELSON (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 372—375).—A transitory decrease in blood-cholesterol, lasting approx. 24 hr., occurs within 1 hr. of treatment. H. G. R.

**Physiological aspects of the cobalt problem [in animal nutrition].** M. E. BELL (*New Zealand J. Sci. Tech.*, 1937, 18, 716—719).—An anæmia often accompanies and accentuates sheep sickness, although the latter may occur independently of anæmia. Sick animals retain their ability to produce insulin, to use org. acids to neutralise bases, and to use glycuronic acid to neutralise toxins. A. G. P.

**Vitamins in cancer therapy.** T. GORDONOFF and F. LUDWIG (*Schweiz. med. Woch.*, 1936, 66, 1129—1130).—The growth of cancer tissue *in vitro* is inhibited in plasma lacking vitamin-A or -B<sub>1</sub>, but is normal in plasma free from -C, -D, or -E. Plasma containing excess of -A or -B<sub>1</sub> causes very active growth; excess of -B<sub>2</sub> has a slightly accelerating effect whilst excess of -C, -D, or -E has none.

NUTR. ABS. (m)

**Effect of X-rays on the metabolism of tumour tissue.** G. BANCROFT and V. E. KINSEY (*Biochem. J.*, 1937, 31, 974—979).—Using the methods of Elliot and Schroeder (A., 1934, 1394) it is found that X-rays produce a definite decrease of the R.Q. of Philadelphia rat sarcoma No. 1 *in vitro* similar to that previously observed *in vivo* (A., 1935, 1525) and an increase in aerobic acid formation (chiefly lactic) indicating that the lowered R.Q. is not due to incomplete oxidation with formation of acids other than lactic. Under conditions which produce a pronounced lowering of R.Q. of tumour tissue, X-rays have no measurable effect on the metabolism of rat kidney slices. X-Rays probably attack the process of carbohydrate oxidation before the AcCO<sub>2</sub>H stage.

P. W. C.

**Effect of diets containing various fish eggs on the growth of tumour in rats.** S. TOKUYAMA and W. NAKAHARA (*Sci. Papers Inst. Phys. Chem. Res. Tokyo*, 1937, 32, 50—55).—Fish roes cause more rapid growth than horse flesh, probably due to their

high arginine and low lysine content. Slow growth with herring-roë diets is anomalous. F. R. G.

**Influence of diets containing proteins of various *Arthropoda* on the growth of tumours in rats.** S. TOKUYAMA and W. NAKAHARA (*Sci. Papers Inst. Phys. Chem. Res. Tokyo*, 1937, 31, 335—341; cf. this vol., 12, 122).—Groups of rats fed on diets containing the proteins of the silkworm, horse, crab, lobster, and grasshopper showed growth rates in the ratio of 0.5:1.0:0.7:0.5:0.1 whereas after inoculation, tumour growth occurred in the ratio 2.2:1.0:0.6:0.5:0.3. It is suggested that the rate of tumour growth is directly  $\propto$  the arginine and inversely  $\propto$  the lysine content of the diet. J. L. D.

**Production of sarcoma in rats as a result of feeding crude wheat-germ oil.** G. M. DORRANCE and E. F. CICCONI (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 426—427).—The time of development of the tumours decreased with increasing amounts of oil. H. G. R.

**Neoplasms in rats resulting from the feeding of crude wheat-germ oil made by ether extraction.** L. G. ROWNTREE, J. LANSBURY, and A. STEINBERG (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 424—426).—The abdominal sarcoma which developed retained its malignancy through 6 successive implantations. H. G. R.

**Effect of injections of rhenium on the growth of tumours in mice.** N. DOBROVOLSKAIA-ZAVADSKAIA and A. RAYNAUD (*Compt. rend. Soc. Biol.*, 1937, 125, 353—355).—No effect on tumour growth was observed. H. G. R.

**Action of intravenous trypsin, carcinolysis, and serum-protein complex.** W. RAAB (*Z. ges. exp. Med.*, 1936, 97, 588—609; *Chem. Zentr.*, 1936, i, 3348—3349).—Man is more sensitive than the dog to trypsin (I) action. The effect of (I) on carcinomatous cells *in vitro* diminishes rapidly and ceases after 12 hr. Pretreatment of the animal induces a "(I)-immunity." In carcinomatous dogs the ratio albumin:globulin in sera averages 0.74 (normal, 1.11). (I) dosage modifies the ratio in healthy but not in carcinomatous animals. A. G. P.

**Magnetic susceptibility of normal and pathological serum.** R. JONNARD (*Compt. rend.*, 1937, 204, 1220—1222).—Human blood is diamagnetic. The normal val. ( $-6.39$  to  $-7.9 \times 10^{-7}$  at  $20^\circ$ ) of  $\kappa$  is increased in cancer. F. O. H.

**Composition of enamel, dentine, and root in caries and pyorrhœa.** M. M. MURRAY and J. H. BOWES (*Brit. Dent. J.*, 1936, 61, 473—477).—Pyorrhœtic enamel has less ash and Ca and more N and P whilst carious enamel has more CO<sub>2</sub> than sound enamel. Compared with sound dentine, pyorrhœtic dentine has a slightly increased and carious dentine a greatly increased Mg content. Diseased but not the sound dentines contain Cl. The Mg content of carious roots is normal but that of pyorrhœtic roots is high. More information is gained from "corrected" than from ordinary Ca:P ratios, the "corrected" ratio being (Ca + Ca equiv. of Mg)/P.

NUTR. ABS. (m)

**Factors in human saliva correlated with the presence and activity of dental caries.** M. KARSHAN (J. Dent. Res., 1936, 15, 383—393).—In persons free from caries or with arrested caries the Ca content of artificially stimulated saliva was 6.1 mg. per 100 ml., whilst in persons with active caries or with similar conditions the val. was 5.3 mg. The corresponding  $\text{CO}_2$  capacities were 30 and 20 vols. per 100 ml. respectively. The proportions of Ca removed by shaking with  $\text{Ca}_3(\text{PO}_4)_2$  were approx. 65% and 45% respectively. Vals. for  $\text{NH}_3\text{-N}$  did not differ significantly. NUTR. ABS. (m)

**Biochemistry of the lens. IX. Influence of vitamin-C and thiol compounds on production of galactose cataract.** J. BELLOW. **X. Preparation of glutathione from the crystalline lens.** J. BELLOW and L. ROSNER (Arch. Ophthalmol., 1936, 16, 762—769, 1001—1003).—IX. Rats receiving a diet containing 70% of galactose (I) show opacities in the lens in 7 days but, if vitamin-C is given in addition, the appearance of changes in the lens is delayed. Administration of yeast, or of cystine, delays the appearance of cataract for 20—30 days. In the lenses of rats receiving galactose diets there is less glutathione (II) and -C than in lenses from normal rats. (I) apparently reduces the thiol content of the cryst. lens.

X. A cryst. substance, closely resembling (II), is extracted from ox lenses by a mixture of EtOH, Et<sub>2</sub>O, and H<sub>2</sub>SO<sub>4</sub> (yield 0.2 g. from 200 lenses).

NUTR. ABS. (m)

**Lachrymal elimination of glucose in diabetics.** D. MICHAEL, P. VANCEA, and N. ZOLOG (Compt. rend. Soc. Biol., 1937, 125, 194—195).—The tears of diabetics contain 0.032—0.084% of glucose, no correlation being observed between this val. and that of the blood-sugar. H. G. R.

**Iodine in the blood of diabetics.** M. YAGISHITA (Mitt. med. Akad. Kioto, 1936, 18, 1201—1206).—The I content of the blood of normal subjects of both sexes in spring and winter is 0.0094 mg. per 100 ml. That of the blood of diabetics is variable (max. 0.0165 mg. per 100 ml.). Lowest vals. are given in cases complicated by tuberculosis. NUTR. ABS. (m)

**Blood-sugar following injection of insulin during absorption of glucose in normal and diabetic subjects.** O. POSTRANECKY (Presse med., 1935, No. 43).—In health, alimentary hyperglycæmia is not affected by administration of insulin but in diabetes the sugar content of the blood is decreased and that of the liver is increased. NUTR. ABS. (m)

**Arterio-venous sugar difference in diabetes mellitus: its value in adjudging the severity of the disease.** J. P. BOSE (Indian J. Med. Res., 1935, 23, 1—20).—The arterio-venous sugar difference, which is positive in normal subjects and mild cases of diabetes, becomes zero or negative in more severe cases, the extent of the decrease depending on the degree of severity. The difference rises rapidly in normal subjects after a meal of glucose (I), reaching a max. in 1 hr. In mild cases the max. difference after a meal of (I) is still positive but < in normal subjects, whilst in more severe cases it is often negative. R. N. C.

**Ammonia coefficient of the urine in treated cases of diabetes mellitus. Effect of diet.** J. L. RENNIE (Glasgow Med. J., 1936, 126, 323—328).—The coeff., calc. from the formula  $100 \times \text{urinary } \text{NH}_3\text{-N}/(\text{NH}_3\text{-N} + \text{urea N})$ , is >5 in healthy individuals. High coeffs. are more frequent following treatment with low- or medium-carbohydrate diet with and without insulin. Special treatment with high-carbohydrate low-fat diets maintains the coeff. at approx. normal level. Fruit is not more effective than are other forms of carbohydrate in lowering the coeff. NUTR. ABS. (m)

**Protein fractions of blood sera. IV. Epidemic dropsy.** R. N. CHOPRA, S. N. MUKHERJEE, and J. C. GUPTA (Indian J. Med. Res., 1935, 23, 353—357).—Relative  $\alpha$  and  $\sigma$  are < their normal vals. in sera of patients with epidemic dropsy. Buffer action is also < normal, although  $p_H$  remains unaltered. Albumin (I) is decreased whilst globulins, particularly pseudoglobulin, are increased. The decreases of  $\eta$  and buffer action, and also the disturbance of the fluid exchange between the blood and tissues, are associated with the fall in (I). R. N. C.

**Arachidonic and linoleic acids of the serum in normal and eczematous subjects.** W. R. BROWN and A. E. HANSEN (Proc. Soc. Exp. Biol. Med., 1937, 36, 113—117).—Arachidonic and linoleic acids occur in the serum of normal children to the extent of 3 and 5% respectively of the total fatty acids. Vals. are lower in eczema. P. G. M.

**Carbohydrate metabolism in epilepsy.** L. J. POLLOCK and B. BOSHER (Arch. Int. Med., 1937, 59, 1000—1023).—The fasting levels for blood-sugar and the oral tolerance test were normal. Insulin hypoglycæmia appeared to be followed by a slow recovery. H. G. R.

**Adsorptive action of colloidal aluminium hydroxide.** H. LODENKAMPFER (Z. ges. exp. Med., 1936, 97, 708—714; Chem. Zentr., 1936, i, 3361).—Elimination of HCl from the stomach in hyperacidity by colloidal  $\text{Al}(\text{OH})_3$  is due to adsorption and not to chemical neutralisation. A. G. P.

**Hypoglycæmia with paradoxical sugar tolerance curve simulating peptic ulcer.** A. R. PESKIN (J. Amer. Med. Assoc., 1937, 108, 1601—1603).—The hypoglycæmia described causes symptoms similar to peptic ulcer but produces an abnormal sugar tolerance curve and gastric hypoacidity. E. M. W.

**Isolation and properties of the factor responsible for increased capillary permeability in inflammation.** V. MENKIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 164—167).—A H<sub>2</sub>O-sol., thermostable, cryst. substance "leukotaxine," isolated from the exudate of inflamed tissue, contains 2.3% of N, is dialysable, free from protein and carbohydrate, and may be an  $\text{NH}_2$ -acid. It increases the permeability of capillaries and exerts a chemotactic attraction on leucocytes. W. O. K.

**Serum-phosphatase in jaundice.** A. CANTAROW and J. NELSON (Arch. Int. Med., 1937, 59, 1045—1050).—No distinction was observed between obstructive and hepato-cellular jaundice. H. G. R.

**Blood-heparin and lipin amino-nitrogen in experimental obstructive jaundice.** L. M. HELLMAN, R. A. MOORE, and W. DE W. ANDRUS (Proc. Soc. Exp. Biol. Med., 1937, 36, 176—178).—In dogs suffering from obstructive jaundice as the result of ligation and division of the common duct, there is no significant change in blood-heparin, but there is a progressive fall in blood-lipin  $\text{NH}_2\text{-N}$ , most of which represents kephalin. W. O. K.

**Influence of protein feeding on the nitrogenous blood constituents in dogs after experimental kidney lesion.** L. SAS (Biochem. Z., 1937, 290, 304—312).—In dogs in which slight kidney lesion had been effected by administration of  $\text{UO}_2(\text{NO}_3)_2$ , the changes in blood-N vals. on protein feeding closely resemble those (A., 1936, 356) in normal dogs. Only in the starved dog was increase of residual N (by 35%) and urea-N (83%) obtained. P. W. C.

**Nitrogen and sulphur metabolism in Bright's disease. VIII. Effect of ingestion of urea on nitrogen excretion and sulphur partition in nephrosis, glomerulo-nephritis, and cirrhosis of the liver.** G. P. GRABFIELD and B. PRESCOTT (Arch. Int. Med., 1937, 59, 823—836).—Data for the intake of N and S and their distribution in urine and faeces indicate changes in protein metabolism mainly affecting the S-containing constituents of the protein mol. F. O. H.

**Standardisation of liver extracts.** J. DEDICHEN (Acta med. scand., 1936, 90, 195—206).—Leucocytosis, possibly due to anti-anæmic factor, follows injection of potent, protein-free liver extracts into healthy adults and pigs (but not rabbits, dogs, or sheep). Inactive fractions cause no significant increase in leucocytes. No leucocytosis follows injection of the extracts into patients with liver disease.

NUTR. ABS. (m)

**Cirrhosis of the liver following chronic intoxication with carbon tetrachloride: experimental study.** M. V. R. RAO (Indian J. Med. Res., 1936, 23, 1007—1014). R. N. C.

**Phosphatase activity, inorganic phosphorus, and calcium of serum in disease of liver and biliary tract.** C. A. FLOOD, E. B. GUTMAN, and A. B. GUTMAN (Arch. Int. Med., 1937, 59, 981—999).—Serum-phosphatase is increased in jaundice due to obstruction of the biliary duct but is variable in catarrhal jaundice or hepatitis. An increase occurs in carcinoma with metastases of the liver. No variation was observed in serum-inorg. P or -Ca.

H. G. R.

**Hyperglycæmia due to impaired hepatic glycogenesis.** J. W. CONN and L. H. NEWBURGH (Proc. Soc. Exp. Biol. Med., 1937, 36, 236—238).—In certain middle-aged obese patients with glycosuria, oxidation of sugar following a test meal was normal although the blood-sugar curve was of the diabetic type. It follows that the defect was in the storage of carbohydrate by the liver, not in its oxidation. These patients became normal after the obesity was reduced by dieting. W. O. K.

**Glycine treatment of progressive muscular dystrophy.** W. BORST and W. MOBIUS (Z. klin.

Med., 1936, 129, 499—511; Chem. Zentr., 1936, i, 3536).—Of four cases examined administration of glycine improved muscle metabolism (increased elimination of creatine) only in two, and caused clinical improvement only in one. A. G. P.

**Chemotherapy. IV. Sulphonamide compounds in coccid infections.** S. M. ROSENTHAL, H. BAUER, and S. F. BRANHAM. **V. Sulphanilamide, serum, and combined drug and serum in experimental infections in mice.** S. E. BRANHAM and S. M. ROSENTHAL (U.S. Publ. Health Rep., 1937, 52, 662—671, 685—695).—IV. Sulphanilamide (I) is effective against pneumococcal infections and is more effective in rats than in mice and rabbits. Disulphanilamide, which is ~20% more toxic than (I), is more effective than (I) against streptococcal infections in mice. Both amides are more effective than proprietary drugs. The effectiveness of the drugs when given parenterally or orally depends on their rates of excretion in the urine.

V. (I) shows a marked therapeutic action in mice experimentally infected with meningococci. Best results are obtained by combined drug and serum treatments, which are also effective against pneumococcal infections. W. L. D.

**Effect of calcium and vitamins-A and -D on incidence of pregnancy toxæmia.** G. W. THEOBALD (Lancet, 1937, 232, 1397—1399). L. S. T.

**Non-protein-, urea-, and residual nitrogen of the blood during normal pregnancy and the puerperium.** J. F. CADDEN and A. M. FARIS (Amer. J. Obstet. Gynecol., 1936, 32, 421—428).—In pregnant women the non-protein-N content of the blood at the end of the 6th month is 24 mg. per 100 ml., at parturition it is 26 mg., and one week later it is 33 mg. The urea-N content decreases during the first 6 months from 14 to 6 mg. per 100 ml.; at term it is 7 mg. and on the 8th day post partum 11 mg. The residual N content decreases to 18 mg. per 100 ml. during the first 6 months, increases to 19 mg. at term, and is 21 mg. on the 8th day post partum. The ratio urea-N: non-protein-N is 0.5 for non-pregnant women. In pregnancy it is 0.25 at the 6th month and 0.27 at term. NUTR. ABS. (m)

**Intra-uterine carbohydrate metabolism.** B. SZENDI (Monatsschr. Kinderheilk., 1936, 66, 128—136).—The glycogen (I) contents of human decidua and placenta increase rapidly to 4% and 2% respectively at the 20th day of conception and decrease to <1% at the 30th day. The (I) content of foetal lungs reaches a max. of approx. 1.3% at the 27th day, after which it decreases to approx. 0.4% at the 30th day, and that of foetal liver increases from approx. 0.2% at the 27th day to a max. of 2.75% on the 32nd day. Similar results are obtained in rabbits. NUTR. ABS. (m)

**Cells of the adrenal cortex of the ewe during the oestral cycle and pregnancy.** L. J. NAHM and F. F. MCKENZIE (Missouri Agric. Exp. Sta. Res. Bull., 1937, No. 251, 20 pp.).—The dark cells, which appear in larger nos. during late oestrus and early and late pregnancy, contain at these times increased amounts of lipins which probably represent material

to be used in the production of secretion. Chondriosomes may also be used to produce secretion or other reserve material. A. G. P.

**Phosphorus components in the blood of normal and rachitic infants.** H. BAKWIN, O. BODANSKY, and R. TURNER (Proc. Soc. Exp. Biol. Med., 1937, 36, 365—368).—Decreased acid-sol. P in rickets involves inorg.  $\text{PO}_4'''$ , acid-hydrolysable P, and the fraction not hydrolysable by bone-phosphatase.

**Geochemistry applied to the problems of silicosis.**—See A., I, 433.

**Treatment of streptococcal infections in mice with 4:4'-diaminodiphenylsulphone.** G. A. H. BUTTLE, D. STEPHENSON, S. SMITH, T. DEWING, and G. E. FOSTER (Lancet, 1937, 232, 1331—1334).—The sulphone cures streptococcal infections in mice in doses approx. 0.01 of those required with  $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  (I); it is much more toxic in mice but not in rabbits or monkeys. It is more active in producing methæmoglobinæmia in monkeys. 4:4'-Dinitrodiphenylsulphone is as effective as (I), but is less toxic to mice. L. S. T.

**Physico-chemical changes in blood in experimental thrombopœnic purpura.** L. M. TOCANTINS (Proc. Soc. Exp. Biol. Med., 1937, 36, 402—406).—A moderate decrease in  $\eta$ , correlated with a decrease in cell vol., together with a transient increase in non-protein-N were observed. H. G. R.

**Indications of liver damage during thyrotoxicosis.** E. GORODETSKI and P. T. SCHESTERIKOVA (Ukrain. Biochem. J., 1937, 10, 127—141).—In Basedow's disease, the serum complement is sometimes decreased, the serum contains a lipase resistant to quinine, and the urinary  $\text{NH}_2$ -acid concn. (normally 2—5%) is increased to 12—16%. These findings indicate liver damage. W. O. K.

**Nitrogen and mineral metabolism during a chronic case of *Trypanosoma congolense* disease in an ox.** M. H. FRENCH (Ann. Rep. Dept. Vet. Sci., Tanganyika, 1935 (1936), 73—77).—Metabolism studies indicate that the disease is accompanied by acidosis. There is increased output of N, Ca, K, and P. Na and Cl excretion is increased when these elements are given in small quantities. Mg metabolism appears to be unaltered. NUTR. ABS. (m)

**Nitrogen and mineral metabolism during acute infections of sheep with *Trypanosoma brucei*.** M. H. FRENCH (Ann. Rep. Dept. Vet. Sci., Tanganyika, 1935 (1936), 77—81).—Infection with *T. brucei* causes increased excretion of N, Ca, and K in sheep on different nutritional levels. P metabolism remains unaffected. Elimination of Na and Cl varies with the level of intake. Adequate NaCl consumption is followed by increased retention of both elements, whereas on a low intake there is an increased rate of excretion. The Mg balance is unaltered. NUTR. ABS. (m)

**Effect of the vitamin-B complex from liver on tubercular patients.** M. ISHII (Bull. Inst. Phys. Chem. Res. Japan, 1937, 16, 265—294).—Nine out of 10 patients in the third stage of pulmonary tuber-

culosis responded, by a general improvement in strength, appetite, red cell count, and hæmoglobin content, to the daily oral administration for 10—15 months of a vitamin-B adsorbate prepared from 75 g. of ox liver (cf. A., 1934, 1415). J. L. D.

**Action of ethyl esters of certain saturated fatty acids on the development of experimental tuberculosis in the guinea-pig.** L. NÈGRE, A. BERTHELOT, and J. BRETEY (Compt. rend., 1937, 204, 1372—1374).—Twice-weekly, subcutaneous injections of 0.5 c.c. of Et arachidate, palmitate, myristate, laurate, and decanoate retard the appearance of tuberculosis in injected guinea-pigs (cf. this vol., 59). Et octoate and hexoate are without effect. Et butyrate sensitises the animals to infection, whilst the benzyl and cinnamyl esters do not. J. L. D.

**Effect of tuberculin and of acetone and methylalcoholic extracts on the pathogenic power of BCG and the action of these substances *in vivo*.** F. LE CHUITON, J. SABRAZES, C. BERGE, J. PENNANEAU, and J. DUBREUIL (Compt. rend. Soc. Biol., 1937, 125, 441—444).—Contrary to the results obtained with strain 6a (cf. *ibid.*, 1936, 123, 581), no increase in the pathogenic power was observed. H. G. R.

**[Automatic] apparatus for measurement of metabolic rate of small animals.** N. T. WERTHESEN (J. Biol. Chem., 1937, 119, 233—239).

R. M. M. O.

**Metabolism of anæsthetised rats.** M. KLEBER and F. J. SAUNDERS (Proc. Soc. Exp. Biol. Med., 1937, 36, 377—380).—Anæsthesia (amylal) is not recommended in metabolism determinations. H. G. R.

**Basal metabolism of older women.** H. MCKAY and M. B. PATTON (Ohio Agric. Exp. Sta. Bull., 1936, No. 575, 16 pp.).—Basal metabolism is fairly uniform in women aged >50 years. Subsequently heat production declines. A. G. P.

**Deamination and specific dynamic action.** A. SZAKALL (Biochem. Z., 1937, 291, 122—137; cf. A., 1934, 554).—In dogs receiving intravenous injections of glycine, alanine, and glutamic acid (I) there is no relation between the amount of N thus given, the extent of deamination of these acids, and the increase in basal metabolism. This increase begins long before and is already falling off when deamination is at its max. Deamination is a consequence, not a cause, of the increased biological oxidation which follows administration of  $\text{NH}_2$ -acids. The increased oxidation is probably due to stimulation of the liver by the acids. (I) interferes with the activity of the liver and hence does not increase oxidation. W. McC.

**Respiration of animal tissues. Unification of two opposing theories.** W. BRANDT (Chem.-Ztg., 1937, 61, 465—467).—The respiratory mechanisms of Warburg and Keilin, Wieland, and Szent-Györgyi are discussed with special reference to the metabolism of oxalacetic acid. F. O. H.

**Respiratory changes in pigeons due to alimentary disequilibrium of carbohydrate origin.** R. LECOQ and J. M. JOLY (Bull. Soc. Chim. biol., 1937,

19, 144—157).—Diets containing glucose, galactose (I), and fructose (II) but free from vitamin-B diminish the R.Q. and increase the basal metabolism of pigeons. Similar effects are produced by -B-rich diets containing 66% of (I) or 80—84% of (II) (cf. A., 1936, 904).

F. O. H.

**Measurement of tissue glycolysis in serum.** M. DIXON (Biochem. J., 1937, 31, 924—933).—The method of Dixon and Keilin (A., 1933, 629) is adapted to the determination of respiration and glycolysis of tissues in serum, and makes use of the CO<sub>2</sub> retention principle of Dickens and Simer (A., 1932, 644).

P. W. C.

**Muscle-hæmoglobin in vivo; instantaneous measurement of muscle metabolism.** G. A. MILLIKAN (Proc. Roy. Soc., 1937, B, 123, 218—241).—Muscle-hæmoglobin acts as a short-time O<sub>2</sub> store, 1.3—3.5 cu.mm. per g. of muscle per sec. being required during max. tetanic contraction of cat's soleus muscle. During the contraction, the O<sub>2</sub> demand reaches a max. within 1 sec. and returns to the resting val. within 10 sec. of the end of the contraction.

H. G. R.

**Effect of dietary protein on the composition of the proteins of blood.** K. LANG (Biochem. Z., 1937, 291, 174—177).—In man the protein content (especially the albumin) of the blood-serum is increased by administration of gelatin but the oxyproline content is not affected.

W. McC.

**Relation between diet and changes in the albumin content of blood-serum in birds.** M. L. ROCHLINA and A. S. KATZNELSON (Bull. Biol. Med. exp. U.R.S.S., 1936, 1, 209—210).—In hens the albumin (I) content of the serum is higher and the egg yield greater when the normal basal ration is supplemented with vitamin-A and -D than when the basal diet alone is given, when it is supplemented with -A only, or when an acid or alkaline ration supplemented with -A, -D, and -E is given. The (I) val. and egg yield are lowest when the basal diet alone is given. The amounts of the vitamins in the rations do not affect the (I) level very greatly, but the absence of -D and -E, and abnormal acidity or alkalinity of the ration, reduce the egg laying capacity. In cocks no notable variations in (I) are observed. In pigeons serum-protein is little affected by different diets. The serum-protein level varies considerably in different species of birds but variations within any one species are slight.

NUTR. ABS. (m)

**Course of the excretion of various substances in exogenous protein catabolism.** E. F. TERROINE and J. FIRDMAN (Bull. Soc. Chim. biol., 1937, 19, 259—291).—The urine of a man during regular H<sub>2</sub>O intake was examined at hourly intervals before and after a protein meal. 11 hr. after the meal 41—50% of the total N intake was excreted, the curve of excretion against time showing a max. after 7 hr. The max. in the curve of urea excretion came after that of NH<sub>2</sub>-acids and NH<sub>3</sub>, which ran parallel throughout. Excretion of uric acid and the coeff. of protein oxidation [urea-N/(urea-N + NH<sub>2</sub>-acid-N + NH<sub>3</sub>-N)] were the same as before the meal. A. L.

U\*\* (A., III.)

**Protein supplements in poultry rations. Effect of different sources of vitamin-D on the laying bird.**—See B., 1937, 725.

**Absorption of rice and atta protein in digestion and the question of the faecal residue as a medium for intestinal putrefaction.** H. E. C. WILSON and S. L. MOOKERJEE (Indian J. Med. Res., 1935, 23, 483—489).—Intestinal putrefaction is not increased in healthy conditions on a rice diet, which yields a larger residue of faecal N than atta protein. There is no evidence of a preferential absorption of S-containing NH<sub>2</sub>-acids.

R. N. C.

**Possible factors in the causation of vesical calculus in India. Composition of the human urine on different diets.** H. E. C. WILSON and S. L. MOOKERJEE (Indian J. Med. Res., 1935, 23, 491—499).—The urine vol. on an atta diet is < on a rice diet, due to a lower salt intake; this may be accentuated by salt loss through perspiration. C<sub>2</sub>O<sub>4</sub>'' and PO<sub>4</sub>''' excretion are increased on an atta diet; enough Ca is excreted to form an insol. salt with all the C<sub>2</sub>O<sub>4</sub>''.

R. N. C.

**Cheap "well-balanced" diets.** W. R. AYKROYD and B. G. KRISHNAN (Indian J. Med. Res., 1936, 23, 731—739).—The results of rat growth tests and chemical analyses of a no. of diets are given.

R. N. C.

**Biological value of the proteins of green-gram (*Phaseolus mungo*) and lentil (*Lens esculenta*).** I. Balance sheet method. II. Growth of young rats. K. P. BASU, M. C. NATH, and M. O. GHANI (Indian J. Med. Res., 1936, 23, 789—810, 811—826).—I. The metabolic N of the faeces of rats fed on green-gram or lentil is composed of two fractions dependent respectively on body-wt. and food intake. The biological vals. at 5%, 11%, and 15% levels of feeding are 63, 52, and 45 respectively for green-gram, and 53, 32, and 25 for lentil, the vals. decreasing as protein concn. in the diet increases. The protein val. of green-gram is 10.4 and of lentil 6.5 at a 10% level of intake. The proteins of the two pulses show no supplementary relation.

II. Growth per g. of protein ingested at 15% and 10% concns. of protein in the diet is 1.23 and 1.16 respectively for green-gram, and 0.94 and 0.59 for lentil. With 5% of protein, animals just maintain their wt. with the green-gram protein, but lose wt. with the lentil protein. With 15% of green-gram protein, growth is almost as efficient as on a diet of milk and whole wheat. Lentil proteins cause loss of fur, which is prevented by addition of 0.2% of cystine to the diet. Rats of 50—80 g. wt. require 9 g. of protein from these pulses for maintenance for 8 weeks.

R. N. C.

**Relation between the composition of the diet and the urinary excretion of ascorbic acid.** R. K. CHAKRABORTY and A. N. ROY (Indian J. Med. Res., 1936, 23, 831—836).—A high-fat diet (butter) or a high-protein diet (casein or meat) produces a significant increase in the daily urinary excretion of ascorbic acid.

R. N. C.

**Effect of different diets on the metabolism of freight horses. IV. Effect of partial substitut-**

tion of oats by the waste products of the sugar industry on the utilisation of nitrogen, calcium, and phosphorus. S. E. BORSHKOVSKI, M. F. GULI, V. A. SMOLJAR, A. K. MARTINENKO, V. V. MICHAILOVA, and M. K. NETSCHITAILO (Ukrain. Biochem. J., 1937, 10, 49—79).—The substitution of sugar-beet press residue and molasses for a portion of the oats in the diet of horses caused little alteration in the assimilation of N or P, but improved the absorption of Ca. This was partly due to the fact that the P:Ca ratio of the diet was reduced from approx. 2.8 to 1.8. W. O. K.

Composition and food value of the locust (*Schistocerca gregaria*). C. LAPP and J. ROHMER (Bull. Soc. Chim. biol., 1937, 19, 321—324).—The locust contains more fat and protein than the majority of the usual foodstuffs. It is rich in mineral constituents and cholesterol. A. L.

Phosphatide metabolism. I. G. DAVANZO (Deut. Z. Chirurg., 1936, 247, 622—631).—In healthy individuals great variations occur in the phosphatide (I) content of the blood. The cholesterol (II) content increases in the premenstrual period but the lecithin (III) content does not appear to vary with the menstrual cycle. An increase in (I) content occurs in obstructive jaundice and a decrease when the hepatic cells are damaged. The increase in the (I) content observed after the ingestion of (III) is delayed and diminished in liver disease. Et<sub>2</sub>O anaesthesia causes an increase of the (II) and decrease of the (I) content. NUTR. ABS. (m)

Purine metabolism in dogs. Metabolic effects of reticulo-endothelial-active substances. F. CHROMETZKA (Z. ges. exp. Med., 1936, 97, 645—652; Chem. Zentr., 1936, i, 3360).—In dogs with sensitive purine metabolism, blocking the reticulo-endothelial system with Indian ink decreases the oxidation of uric acid (I) to allantoin (II). Neosalvarsan increases the elimination of purine bases and (I), especially when used in conjunction with Indian ink. The output of (II) is unchanged. The antiseptic Protonsil increases the output of (I) and lowers that of (II). Atebrin acts similarly. A. G. P.

Xanthine dehydrogenase. Dehydrogenation of uric acid to xanthine by surviving tissue. W. REINDEL and W. SCHULER (Z. physiol. Chem., 1937, 247, 172—184).—Slices of surviving kidney (rat, guinea-pig, cat) aerobically convert xanthine (I), but, unless methylene-blue is present, not hypoxanthine (II), into uric acid (III). The anaerobic dehydrogenation of oxypurines thus occurs more readily than the aerobic; both are strongly inhibited by 0.001M-KCN. (II) is completely converted into (I) before dehydrogenation to (III). In systems of (II) + (III) + tissue containing (I) dehydrogenase, hydrogeneration of (III) to (I) is correlated with dehydrogenation of (II) to (I). The bearing of these findings on purine metabolism is discussed. F. O. H.

Influence of aggregation on the transport of asparagine and caffeine in the tentacles of [the insectivorous plant] *Drosera capensis*. W. H. ARISZ and J. OUDMAN (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 431—439).—Caffeine appears

to be absorbed (from agar gel) by a diffusion process, the vacuoles serving as a path of transport. With asparagine, rapid absorption occurs only when the tentacle cells are aggregated (by salicin-KH<sub>2</sub>PO<sub>4</sub>), transport being principally by the cytoplasm, the quantity of which negatives the possibility of the occurrence of a normal diffusion process.

F. O. H.

Effect of glycine on the production of creatine in the normal subject. C. DEGAN (Bull. Soc. Chim. biol., 1937, 19, 686—693).—When glycine is administered to dogs on a carbohydrate diet, there sometimes occurs an increase in urinary creatine which represents, however, only a small proportion of the excess urinary N. Creatinine excretion is unaffected with the exception of occasional irregular changes.

P. W. C.

Cystine metabolism. II. Detoxication of bromobenzene. F. L. HALEY and G. S. SAMUELSEN (J. Biol. Chem., 1937, 119, 383—387).—No quantitative relationship appears to exist between the amount of cystine or other S compounds in the diet and the detoxication of PhBr, which is tolerated by the rat to the extent of 2% of the diet. P. G. M.

Metabolism of sulphur. V. Replaceability of *l*-cystine in the diets of rats with some partially oxidised derivatives. M. A. BENNETT (Biochem. J., 1937, 31, 962—965).—Identical growth curves were obtained with *l*-cystine (I) (Merck) and a highly purified (I) when added to a (I)-deficient diet of albino rats. *l*-Cystine disulphoxide can replace (I) in the diet but *l*-cysteinesulphinic acid gave no, and *S*-(guanythio)cysteine dihydrochloride, which probably gives rise to *l*-cysteinesulphenic acid, a slight, increase in growth. The reactions involved are discussed. P. W. C.

Amino-acid metabolism. II. Fate of *d*- and *dl*-glutamic, *dl*-pyroglutamic, and *l*- and *dl*-aspartic acids in the normal animal. J. S. BUTTS, H. BLUNDEN, and M. S. DUNN (J. Biol. Chem., 1937, 119, 247—255; cf. A., 1936, 233).—The acids studied were maintained for varying periods in the intestine under conditions to produce continuous absorption at max. rate; the animals were then killed for determination of glycogen and unabsorbed NH<sub>2</sub>-acid. Ketolytic activity was studied by superimposing the same treatment on a previous feeding of PrCO<sub>2</sub>Na. *d*-Glutamic acid (I) is active both in glycogen formation (> the *dl*-acid) and in ketolysis. *l*-Aspartic is somewhat superior to both (I) and *dl*-aspartic acid. Pyroglutamic acid resembles (I) in its metabolism. R. M. M. O.

*d*-Glutamic acid as a salt substitute. III. F. MAINZER (Wien. Arch. inn. Med., 1936, 29, 315—320).—Administration of 20 g. of glutamic acid (I) has no effect on the amount or concn. of Cl excreted. The quantity of urea produced (4 g.) is small. 20 g. of (I) exceeds the daily requirement as a NaCl substitute. NUTR. ABS. (m)

Formation of histamine from histidine by animal tissues. E. WERLE and H. HERRMANN (Biochem. Z., 1937, 291, 105—121; cf. this vol., 18).—Slices of rabbit and guinea-pig kidney convert

*l*-histidine (I) (but not *d*-histidine) into histamine (II), max. yield being attained in 40–60 min. at  $p_H$  9.0 and 37.5° with (I) concn. 1.6*M*. Rabbit and guinea-pig liver and guinea-pig pancreas also convert (I) into (II). Glycerol and aq. extracts (also Tyrode's solution) of rabbit's kidney also produce (II) from (I), the yield increasing with increase in the concns. of the substrate and the decarboxylase (III). (III) is concentrated by pptn. (half saturation) with  $(NH_4)_2SO_4$ . The conversion of (I) into (II) is inhibited by Cu, Fe, and HCN. Probably the amount of (II) produced depends on the relative proportions of (III) and histaminase (IV) present. Organs containing sufficient (IV) may produce (II) which cannot be detected owing to the action of (IV). W. McC.

**Metabolism of glyoxaline. III. The digestive or metabolic origin of glyoxaline in the urine of various animals.** P. LELU (Bull. Soc. Chim. biol., 1937, 19, 292–302; cf. this vol., 129).—The glyoxaline (I) excretion of rats, dogs, and rabbits injected with histidine (1 g. per kg. body-wt.), and when the min. level of endogenous metabolism was reached, was slow. During the experimental period, (I) in the urine of the rabbit was ten times > that in the dog and rat. The origin of (I) is therefore probably metabolic. A. L.

**Production of tyramine in warm-blooded animals.** H. A. HEINSEN (Z. physiol. Chem., 1937, 246, 282).—A correction (cf. this vol., 91).

F. O. H.

**Biological formation of hordenine.** Y. RAOUL (Bull. Soc. Chim. biol., 1937, 19, 675–685).—Tyrosine on heating at 250° under reduced pressure gives tyramine (yield 50%) which on refluxing with  $CH_2O + HCO_2H$  for 10 hr. affords hordenine (I) (yield 50%). The same mixture on keeping at room temp. after a week contains traces, and after a month a 16% yield, of (I). The possibility of  $CH_2O$  being similarly used in nature for methylating tyramine in the production of (I) is discussed. P. W. C.

**Degradation of tyrosine and related substances by liver- and kidney-pulp.** K. FELIX, K. ZORN, and H. DIRR-KALTENBACH (Z. physiol. Chem., 1937, 247, 141–166).—*l*-Tyrosine (I) is oxidised in presence of pig's liver-pulp in three stages (according to  $[H^+]$ ) with  $O_2$  consumption of 1, 2, and 4 atoms, respectively, the final products being  $CH_3Ac \cdot CO_2H$  (II) and  $CO_2$ . *p*-Hydroxyphenylpyruvic (III) and homogentisic acid (IV) are not intermediaries whilst  $NH_3$  is not liberated. *dl*-(I) is oxidised completely by 4 O, (III) and  $NH_3$  being formed in amounts equiv. to the *d*-(I). Under appropriate conditions, (III) is oxidised by 3 O to (II) and  $CO_2$  and (IV) by 2 O to (II). With kidney-pulp, both *l*- and *dl*-(I) are oxidised (by O) but deamination only occurs with *dl*-(I), the liberated  $NH_3$  then corresponding with the *d*-(I). With either liver- or kidney-pulp, *l*-phenylalanine (V) is oxidised (O) without formation of  $NH_3$ , keto-acid, or (I); *d*-(V) is oxidised (>1 O) with equiv. liberation of  $NH_3$ , the phenylpyruvic acid (VI) produced being oxidised to  $CH_3Ph \cdot CO_2H$  and  $CO_2$ . Kidney extracts oxidise only *d*-(I) to  $NH_3$  and (III) and deaminate *d*-(V) to (VI). Thus kidney-pulp contains two enzyme-systems, one dehydrogenating the naturally occurring

optical isomeride of (I) and (V) without deamination ( $NH_2$ -acid dehydrogenase) and the other, readily extractable, oxidatively deaminating the non-naturally occurring isomeride ( $NH_2$ -acid deaminase).

F. O. H.

**Metabolism of nitrogen and the lungs. L.** BINET and M. BURSTEIN (Compt. rend. Soc. Biol., 1937, 125, 120–121).—The hypotensive action of blood containing peptone is decreased on perfusion through the lung *in vitro*.

H. G. R.

**Absorbability of sterols with particular reference to oestresterol.** W. M. SPERRY and W. BERGMANN (J. Biol. Chem., 1937, 119, 171–176).—On feeding mice with oestresterol, which is constitutionally related to the non-absorbable plant sterols although of animal origin, the liver-sterol content is significantly increased above the level produced by diets containing no added sterol or only unabsorbable sterols. R. M. M. O.

**Absorption of fat from the human ileum.** H. DOUBILET and M. REINER (Arch. Int. Med., 1937, 59, 857–864).—Clinical data (one case) indicate that the ileum secretes a fluid containing 2% of lipins. Bile acids increase the vol., but not the concn., of the secretion and, in small amounts, do not affect the absorption of olive oil or oleic acid. F. O. H.

**Physiology of digestion. I. Effect of calcium salts on the digestion of fats.** Y. NAKAMURA (Z. ges. exp. Med., 1936, 99, 494–497).—Addition of  $H_2O$ -sol. Ca salts to milk causes pptn. of almost all the Ca as soaps; addition also of bile does not affect the results. In dogs, administration of Ca lactate causes increased faecal excretion of Ca, fat, and fatty acids. NUTR. ABS. (m)

**Absorption of olive oil.** V. DUCCESCHI and A. RONCATO (Quad. Nutrizione, 1936, 3, 368–385).—In man absorption of crude oils refined by neutralisation of free fatty acids is as high as is that of first quality "virgin" olive oil. NUTR. ABS. (m)

**Biological oxidation of highly unsaturated fatty acids.**—See A., II, 321.

**Fate of morphine in the animal organism.** H. SIMONNET (Compt. rend., 1937, 204, 1371–1372).—Minced liver or brain destroys morphine (I) to the extent of 4.5–38% depending on the conditions of temp. and concn. The liver, perfused at 39° with Ringer's solution containing 0.05% of (I), does not destroy the drug, whilst the perfused head destroys 20–60%. J. L. D.

**Fate of phenol injected into the circulating blood.** A. D. MARENZI (Compt. rend. Soc. Biol., 1937, 125, 547–548).—Conjugation is rapid in all the organs but is slower if the small intestine is removed. H. G. R.

**Effect of infundibular puncture on the blood-sugar and hepatic glycogen in rats.** M. CAHANE (Compt. rend. Soc. Biol., 1937, 125, 192–194).—Hyperglycemia reaches a max. in 3 hr. and returns to normal in 24 hr., whilst a progressive decrease occurs in liver-glycogen. H. G. R.

**Cyclic variation of liver-glycogen of the white mouse, determined by the number-of-stages**

**method.** G. C. HIRSCH and R. F. J. VAN PELT (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 538—546).—Results obtained by Agren *et al.* (A., 1931, 980) using chemical methods have been confirmed by Hirsch's method. In March, the liver contained the max. amount of glycogen (I) between 8 p.m. and 2 a.m. and the min. between 12 and 5 p.m. Winter animals are somewhat later, and spring animals somewhat earlier, in reaching the max. of the (I) cyclic change. J. N. A.

**Utilisation of carbohydrates by carnivora.** R. SCHOENEMANN (Landw. Versuchs-Stat., 1937, 128, 1—88).—Glucose, fructose, sucrose, and maltose were less effective than starch in producing fat in dogs. Results of numerous feeding trials are discussed in relation to the bacterial activity of the intestine and the supposed stimulative action of the sugars. A. G. P.

**Metabolism of carbohydrates in avitaminosis-B<sub>1</sub>.** I. I. NITZESCU, G. BENETATO, and R. OPREAN (Compt. rend. Soc. Biol., 1937, 125, 188—191).—The disturbance in carbohydrate metabolism is due to a derangement in the aerobic phase of metabolism, due to a decrease in respiration. H. G. R.

**Carbohydrate metabolism of small ruminants. Acid-base equilibrium and behaviour of blood-sugar.** J. BRUGGEMANN (Arch. wiss. pr. Tierheilk., 1936, 71, 107—137).—Determinations of blood-sugar (I) and -lactic acid (II) and of the alkali reserve of the blood-plasma of 6 ewes, a ram, and a dog before and after large doses of glucose, fructose, galactose, lactic acid, Na lactate, or HCl, given orally, intravenously, intraperitoneally, and by fistulae, show that, in sheep, (I) does not vary greatly under normal conditions. Appreciable variations occur in (II), these being usually accompanied by corresponding inverse variations in the alkali reserve. Carbohydrate metabolism and acid-base equilibrium in small ruminants are qualitatively similar to those in carnivores. NUTR. ABS. (m)

**Rate of absorption of glucose from the gastrointestinal tract of the cat, and the effect of insulin on the absorption coefficient.** H. CHAUDHURI and B. S. KAHALI (Indian J. Med. Res., 1936, 23, 963—971).—The optimum concn. of glucose for absorption is 0.55—0.75*M*. The average absorption coeff. with 0.55*M* solution injected directly into the duodenum is 0.48; it is lowered by simultaneous injection of insulin. R. N. C.

**Formation of glucose-1-phosphoric acid in muscle extract.** G. T. CORI and C. F. CORI (Proc. Soc. Exp. Biol. Med., 1937, 36, 119—122).—Adenylic acid (and to a small extent inosic acid) catalyses the phosphorylation of glucose. With minced and washed muscle, the rate of formation of the 1-ester exceeds the rate of conversion into the 6-ester (which is rapid with fresh muscle extract). Addition of Mg<sup>++</sup> catalyses the conversion of 1- into 6-ester but does not affect phosphorylation. P. G. M.

**Glycolysis without phosphorylation in the chick embryo.** J. NEEDHAM and H. LEHMANN (Nature, 1937, 139, 368—369).—Further details support the view that glycolysis proceeds in young

tissues without phosphorylation (A., 1936, 1411). In this case glutathione is necessary, and AcCHO, CO(CH<sub>2</sub>·OH)<sub>2</sub>, and glycerol are not intermediates. L. S. T.

**Glutathione and the Pasteur reaction.** Z. BAKER (Biochem. J., 1937, 31, 980—986).—Glutathione (I) has no significant effect on the aerobic glycolyses of tumour, brain, testes, and embryo, as measured in the Dixon-Keilin manometers. The results do not indicate that (I) participates in the Pasteur reaction. The sp. effect of NHPH·NH<sub>2</sub> on the Pasteur reaction observed by Dickens in Jensen sarcoma was not found in other tumours. Increased aerobic glycolysis was normally paralleled by inhibited respiration. P. W. C.

**Utilisation of ketones by the tissues in ketosis.** R. H. BARNES and D. R. DRURY (Proc. Soc. Exp. Biol. Med., 1937, 36, 350—352).—Ketones are oxidised by the tissues in ketosis. H. G. R.

**Ketosis. XI. Relation of fatty livers to fasting ketonuria in the rat.** H. J. DEUEL, jun., L. F. HALLMAN, and S. MURRAY (J. Biol. Chem., 1937, 119, 257—268).—No appreciable ketonuria results from a period of fasting following administration of a stock diet (5.4% of fat). Fasting ketonuria, which is higher in females, follows the feeding of a high-fat diet. The liver-fat is highest following feeding of butter fat, whilst ketonuria is greatest following administration of cod-liver oil. The rate of decrease in liver-fat is slowest following a high-cholesterol diet. P. G. M.

**Ketogenesis.** P. P. COHEN (J. Biol. Chem., 1937, 119, 333—346).—A sp. skeleton group, ·CH<sub>2</sub>·CH<sub>2</sub>·CO· or ·CH·CH·CO· is necessary for oxidation by a β-oxidase system, and oxidation will occur β to the CO<sub>2</sub>. Antiketogenesis of the higher odd-numbered fatty acids is explained on a scheme involving the hypothetical intermediates β-hydroxyacrylic and glyceric acid. P. G. M.

**Ratio  $Q_a : Q_e$  and the Nicloux coefficient  $K$  for acetone with *Carassius auratus*.** (A) G. FONTES and A. LINDENBERG. (B) M. NICLOUX (Compt. rend. Soc. Biol., 1937, 125, 456—458, 458).—(A) The mean vals. for  $Q_a : Q_e$  and  $K$  are 0.695 and 1.46 respectively. (B) H<sub>2</sub>O impermeable to EtOH is also impermeable to COMe<sub>2</sub>. H. G. R.

**Influence of various avitaminoses on lactic acid metabolism.** F. E. KRUSIUS and P. E. SIMOLA (Biochem. Z., 1937, 290, 428—443).—Lack of vitamin-A has no effect on the blood-lactic acid (I) content of rats or guinea-pigs and lack of -C in guinea-pigs causes a very slight increase of (I). Lack of the -B complex after a short time causes a 58% increase of blood-(I). Feeding autoclaved yeast (-B destroyed) causes an 88% increase of blood-(I) which is decreased to 47% when -B<sub>1</sub> is also administered. Feeding -B<sub>1</sub> without autoclaved yeast produces an increase of 200% in blood-(I). A similar increase is obtained on feeding with protein of hen's egg. In fasting animals the vals. are normal. P. W. C.

**Phosphorus metabolism. VII. Course of phosphorus in alimentary tract of the rat.** G. E.

YOUNGBURG (Proc. Soc. Exp. Biol. Med., 1937, 36, 230—233; cf. A., 1936, 886).—A substantial secretion of P compounds, especially inorg.  $\text{PO}_4^{3-}$  and phospholipins, into the intestinal lumen through the wall is indicated. W. O. K.

**Phosphorus metabolism in normal and rachitic rats with a radioactive phosphorus isotope.** M. J. L. DOLS, B. C. P. JANSEN, G. J. SIZOO, and J. DE VRIES (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 547—558).—The prep. of radioactive  $^{32}\text{P}$  together with a method for its determination in the body are described. There was a very good recovery of P administered as "active"  $\text{Na}_2\text{HPO}_4$  either by stomach tube or by injection into the tail vein. In each case a rapid entrance of P into bone was observed. Gross absorption and re-excretion of P into the intestine were similar in normal and rachitic rats, and in rachitic rats which had previously received large doses of vitamin-D.

J. N. A.

**Disturbances of calcium and phosphorus absorption.** J. CAYLA (Progr. méd. Paris, 1935, No. 43).—In general, 50% of the Ca and 35% of the P ingested is not absorbed from the intestine. Even with a sufficiency of both and the diet and bile secretion normal, absorption is defective if there is insufficient phosphatase (I) production, and if the  $\text{H}_3\text{PO}_4$  liberated is neutralised by excess of alkali or pptd. in insol. form. Even with excess of Ca, absorption may be normal if there is sufficient (I) present to cause rapid liberation of  $\text{H}_3\text{PO}_4$  and to dissolve Ca. Vitamin-D appears to establish such conditions. Excess of fat, which ppts. part of the Ca, or addition of acid has a similar effect. Ca deficiency does not affect P absorption, but P deficiency reduces Ca absorption.

NUTR. ABS. (m)

**Nutritional economics of dietary calcium.** F. L. GUNDERSON (Amer. J. Publ. Health, 1937, 27, 570—574).—The Ca contents of certain foodstuffs are tabulated and the relative cost to the consumer of the amount to give 1 g. of Ca is calc. W. L. D.

**Excretion of calcium by the large intestine of the rabbit.** S. J. COWELL (Biochem. J., 1937, 31, 848—855).—Under certain conditions, the concn. of Ca per g. of dried faeces increases as the latter passes along the upper part of the large intestine. Higher concns. of both Ca and P are found in the outer shells of the faecal pellets than in the inner portions when rabbits have received a mixed diet containing plenty of Ca. Reasons are given for interpreting the results as evidence that Ca can be excreted by the upper part of the rabbit colon and the physiological significance is discussed. P. W. C.

**Effect of cereals on calcium, magnesium, and phosphorus assimilation.** S. RANGANATHAN (Indian J. Med. Res., 1935, 23, 229—236).—Ca assimilation by rats is high on whole wheat, polished rice, or cholam diets, but low on cambu or ragi. The Mg balance is positive only on the whole wheat and polished rice diets. P retention is high and of the same order on all the five diets. R. N. C.

**Applications of the allometry formula to the study of animal growth.** P. MEUNIER (Bull. Soc.

Chim. biol., 1937, 19, 244—258; cf. A., 1936, 1034).—The fixation of Ca and K by the developing chick embryo takes a course analogous to that of total and non-protein-N. Application of the equation of allometry to the vals. for the contents of org. matter,  $\text{H}_2\text{O}$ , P, Mg, ash, and Ca during the ossification of the humerus and femur of rats serves to co-ordinate the data for these factors and to show that there is a marked change in the process of ossification when the body-wt. is 30—50 g. A. L.

**Effects of a bivalent cation on sodium removal from intestinal loops.** R. C. INGRAHAM and M. B. VISSCHER (Proc. Soc. Exp. Biol. Med., 1937, 36, 201—202).—When NaCl and  $\text{MgCl}_2$ , each in semi-isotonic concns., are placed in an isolated loop of the intestine of a dog under amytal anaesthesia,  $\text{Na}^+$  is absorbed and the  $[\text{Na}^+]$  may fall to  $\frac{1}{20}$  of that in blood-serum. W. O. K.

**Retention and utilisation of small amounts of orally administered iron.** W. M. FOWLER, A. P. BARER, and G. F. SPIELHAGEN (Arch. Int. Med., 1937, 59, 1024—1028).—1—1.5 g. of  $\text{Fe NH}_4$  citrate is sufficient to replenish depleted Fe stores and to produce a fairly rapid increase in haemoglobin in hypochromic anaemia. H. G. R.

**Metabolism of nitrogen and sulphur in dietary supplements.** A. RAJZMAN (Arch. internat. Physiol., 1936, 43, 397—422).—Total S in food and faecal material is determined by oxidising the material in a bomb calorimeter, further oxidising with aq. Br, removing Fe and Ca, and pptg. the S as  $\text{BaSO}_4$ . The N : S ratio of the material stored by pigs during growth remains approx. const. despite variations in the quality of the protein fed. NUTR. ABS. (m)

**Sulphurous acid and formaldehyde in corpses.** W. SPECHT (Deut. Z. ges. gerichtl. Med., 1936, 26, 341—350; Chem. Zentr., 1936, i, 3551—3552).—Both  $\text{SO}_2$  and  $\text{CH}_2\text{O}$  may be present as natural degradation products. H. J. E.

**Rationale of certain methods used in physical treatment.** (SR) L. HILL (Lancet, 1937, 232, 1035—1039).—A lecture. Physiological effects and uses of Ra radiations, X-rays, ultra-violet and infra-red light, and high-frequency electric waves are described. L. S. T.

**Role of electrical, photo-chemical, and diffusion processes in vision.** L. S. ORNSTEIN and J. F. SCHOUTEN (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 376—382).—Stimulation of part of the retina by light produces a sudden fall in the sensitivity of the fovea to a const. level (lasting approx. 0.1 sec.) followed by a rapid recovery ("α-adaptation") after short (<10 sec.) exposures and by a slow recovery ("β-adaptation") after long exposures. The mechanism of these changes is discussed. F. O. H.

**Radioactivity of thorium dioxide sol.** R. B. TART (J. Amer. Med. Assoc., 1937, 108, 1779—1781).—Measurements with a Geiger counter show that a clinical dose of  $\text{ThO}_2$  sol (75 c.c.) is equiv. in γ-ray activity to  $1.37 \times 10^{-6}$  g. of Ra. Since little is excreted this is a dangerous dose. E. M. W.

**Effect of radioactive phosphorus on the blood of growing chicks.** K. G. SCOTT and S. F. COOK (Proc. Nat. Acad. Sci., 1937, 23, 265—272).—Oral administration of radioactive (prepared from red P by deuteron bombardment) and oxidation with  $\text{HNO}_3$  has little effect on the lymphocytes, but markedly decreases the polymorphonuclear leucocytes of young growing chicks. Radioactive P may be of use for direct irradiation of the bone marrow, in the neighbourhood of which it is selectively deposited.

W. O. K.

**Effect of variations in atmospheric ozone on the biological activity of sunlight.** R. LATARJET (Rev. Opt. theor. instrument., 1935, 14, 398—414; Chem. Zentr., 1936, i, 3537).—A mathematical relation between biological activity (measured by erythema of the skin), the proportion of  $\text{O}_3$ , its absorption coeff., and the intensity and  $\lambda$  of the sunlight is established.

A. G. P.

**Effect of incubation temperature on time of death of chick embryo, and relation of energy metabolism to mortality.** E. M. PRINGLE and H. G. BAROTT (J. Agric. Res., 1937, 54, 465—468).—The rate of change in energy metabolism and mortality in chick embryos are related. Peak mortality occurs at the third day and shortly before hatching.

A. G. P.

**Anabiosis and fish transport without water.** P. J. SCHMIDT and G. P. PLATONOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 255—260).—Fish of various species after chilling in ice-cold  $\text{H}_2\text{O}$  may be preserved and transported on ice for  $>10$  days in air and for  $\leq 2$  days in  $\text{N}_2$ . A large proportion revive when placed in cold  $\text{H}_2\text{O}$  at a suitable temp.

W. O. K.

**Utilisation of oils as perfusates.** G. ETTISCH and S. F. G. DA COSTA (Compt. rend. Soc. Biol., 1937, 125, 560—562).—*Ascaris* can be maintained alive in oil (with the exception of castor oil) and the physiological effects of some substances can be demonstrated in oily solution.

H. G. R.

**Increase of body-activity by artificially induced changes in the acid-base equilibrium.** H. DENNIG (Chem.-Ztg., 1937, 61, 526—527).—Production of alkalosis in man by ingestion of  $\text{NaHCO}_3$ ,  $\text{KHCO}_3$ , Na citrate, or suitable diets permits a 30—100% increase in physical activity which is most marked on the 2nd day following ingestion.

F. O. H.

**Sodium salts and [alimentary] disequilibrium.** R. LECOQ (Compt. rend. Soc. Biol., 1937, 125, 434—436).—Polyneuritic symptoms are developed in pigeons on a normal diet containing large quantities of NaCl or  $\text{Na}_2\text{SO}_4$ .

H. G. R.

**Pharmacological action of tannic acid. VII. Action on diuresis produced by hypertonic sodium chloride solution.** U. SAMMARTINO (Arch. Farm. sperim., 1937, 63, 81—113; cf. A., 1936, 1148).—Intravenous injection of  $\text{NaCl}$  into rabbits produces an excretion of  $\text{H}_2\text{O}$   $>$ , and of  $\text{NaCl}$   $<$ , the amount injected, respectively. The diuresis is not modified by injection of aq. tannic acid.

F. O. H.

**Zinc [and growth of rats].** W. R. SUTTON and V. E. NELSON (Proc. Soc. Exp. Biol. Med., 1937, 36, 211—213).—The growth and health of rats are seriously impaired by the presence in the diet of  $\text{ZnCO}_3$  equiv. to 1% of Zn. When 0.5% of Zn is present, the animals grow normally, but reproduction is disturbed and blood-haemoglobin is lowered.

W. O. K.

**Relative effectiveness of iodine in thyroxine, di-iodotyrosine, and potassium iodide in inducing metamorphosis in amphibia.** A. LEIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 348—350).—I in thyroxine is 300 times as active as that in di-iodotyrosine, which is more active than that of KI.

H. G. R.

**Action of di-iodotyrosine, iodine, and iodo-glidin on the cholesterol content of the blood.** P. GHALIOUNGUI and F. ZELL (Arch. exp. Path. Pharm., 1937, 185, 71—76).—Di-iodotyrosine (I) administered by stomach tube causes in rabbits a decrease of 12—42% in total cholesterol (II), the decrease consisting almost entirely of esterified (II). The effect is of the same order for doses of (I) from 12.5 to 200 mg. and is inhibited by veronal. Iodoglidin (0.48 g.) has a similar but Lugol solution had no effect.

P. W. C.

**Anticonvulsant properties of some phenyl derivatives.** T. J. PUTNAM and H. H. MERRITT (Science, 1937, 85, 525—526).—A method for determining the convulsant effects of drugs is described. Of the many phenolic compounds investigated diphenylhydantoin,  $\text{COPhMe}$ , and  $\text{COPh}_2$  have, towards the cat, the greatest anticonvulsant activity combined with the least relative hypnotic effect.

L. S. T.

**Effect of 2:4-dinitrophenol on oxygen consumption of the rabbit lens.** J. FIELD, 2nd, and E. G. TAINTER (Proc. Soc. Exp. Biol. Med., 1937, 36, 277—278).—Concns. of 0.05—1.25 mg. stimulate whilst those  $>5$  mg. per 100 c.c. inhibit  $\text{O}_2$  consumption; the optimum concn. is 0.10—0.30 mg. per 100 c.c.

P. G. M.

**Active form of 2:4-dinitrophenol in the stimulation or inhibition of oxygen consumption of excised rabbit muscle.** A. W. MARTIN and J. FIELD, 2nd (Proc. Soc. Exp. Biol. Med., 1937, 36, 375—377).—The undissociated is the active form of 2:4-dinitrophenol (cf. A., 1935, 1539).

H. G. R.

**Relative toxicity of cresols as demonstrated by tests with *Carassius auratus*.** W. A. GERSDORFF (J. Agric. Res., 1937, 54, 469—478).—Relative toxicities of *p*-, *o*-, and *m*-cresol, and  $\text{PhOH}$  were 2.0:1.3:1.0:1.1. Rotenone was approx. 360 times as toxic as *m*-cresol.

A. G. P.

**Sulphaemoglobinaemia and methaemoglobin-aemia following administration of *p*-amino-benzenesulphonamide.** J. P. J. PATON and J. C. EATON (Lancet, 1937, 232, 1159—1162).—Administration of  $\text{MgSO}_4$  simultaneously with or  $>3$  days before that of  $p\text{-NH}_2\text{C}_6\text{H}_4\text{SO}_2\text{NH}_2$  (I) generally produces sulphaemoglobinaemia. Formation of sulphaemoglobin (II) occurs rapidly even after small doses of (I). In absence of  $\text{SO}_4^{2-}$  large doses of (I)

are well tolerated, but 12–24 g. per day often result in methæmoglobinæmia. The removal of (II) from the blood is much slower than removal of methæmoglobin, which disappears in approx. 24 hr. Spectroscopic examination of the blood is a more effective method of detecting sulphæmoglobinæmia than is clinical observation of cyanosis.  $O_2$  is of val. in treatment of methæmoglobinæmia, but not of sulphæmoglobinæmia. L. S. T.

**Hydrotropic action of Convolvulaceæ resins on lecithin.** G. VALETTE (Compt. rend. Soc. Biol., 1937, 125, 405–407).—The quantity of lecithin dissolved by the bile is increased by the addition of these resins. H. G. R.

**Hæmolytic action of Convolvulaceæ resins and their hydrolysis products.** G. VALETTE (Compt. rend. Soc. Biol., 1937, 125, 407–409).—The hæmolytic action of the bile salts is increased by the resins and, to a smaller extent, by their hydrolysis products. H. G. R.

**Physiological behaviour of acetyl derivatives of optical isomerides of homocystine; biological proof of their stereostructure.** V. DU VIGNEAUD, H. M. DYER, and C. B. JONES (J. Biol. Chem., 1937, 119, 47–57; cf. A., 1935, 737).—*Acetyl-L-homocystine*,  $[\alpha]_D -21.3^\circ$  in  $H_2O$ , was capable of supporting growth of rats on a cystine-deficient diet and was also oxidised *in vivo* by the rabbit. *Acetyl-D-homocystine*,  $[\alpha]_D^{25} +21.5^\circ$  in  $H_2O$ , did not support growth and was oxidised only with difficulty. The results are discussed from the viewpoint of Ac derivatives of other stereoisomeric  $NH_2$ -acids. J. N. A.

**Effects of some products of digestion and accessory substances on the rhythmical contractions of the isolated mammalian intestines.** R. K. PAL and S. PRASAD (Indian J. Med. Res., 1935, 23, 515–523). R. N. C.

**Substances affecting adult tissue *in vitro*.** III. A stimulant (the "A" factor) in serum ultrafiltrate involved in overcoming adult tissue dormancy. H. S. SIMMS and N. P. STILLMAN (J. Gen. Physiol., 1937, 20, 649–662; cf. A., 1936, 1021).—Fresh adult tissue implanted into a plasma medium grows faster, after a shorter induction period, when it has had a previous incubation in serum. The factor responsible for this is not identical with the known proteins or enzymes, passes an ultrafilter, and is not species-sp. It gives ppts. with  $Cu^{++}$  and  $Ca^{++}$ , withstands heating at  $100^\circ$  for 10 min. at  $p_H$  7, but is destroyed in longer periods (3 hr.) or at widely different  $p_H$ . The stimulating activity is possessed by urine and lymph, and, to a smaller extent, by ventricular fluid. F. A. A.

**Recovery of divinyl ether from human tissues.** T. J. DOMANSKI (J. Biol. Chem., 1937, 119, 69–72).—Methods for recovering the ether from brain and from aq. solution are described. The average recovery from 500 g. of brain containing 0.16 to 0.39 c.c. is 58.2%, whilst that from aq. solution containing 0.5 to 1.0 c.c. per litre is 90.5%. J. N. A.

[Production of] rhythmic automatism in the muscle of the leech by quinine phenylethylbarbiturate and its suppression by potassium

chloride. H. BUSQUET (Compt. rend. Soc. Biol., 1937, 125, 618–620). H. G. R.

**Identification of hypnotics in viscera.** M. J. PAPAVALASSIOU and S. N. LIBÉRATO (J. Pharm. Chim., 1937, [viii], 25, 586–595).—The viscera are extracted with an org. solvent and the product so obtained is micro-sublimed. Photomicrographs of sublimed trional, tetronal, sulphonal, propanal, phanodorm, dial, veronal, and luminal are given for comparison. Identity is confirmed by m.p. J. N. A.

**Locoine, the poisonous principle of the loco weed, *Astragalus carlei*.** G. S. FRAPS and E. C. CARLYLE (Texas Agric. Exp. Sta. Bull., 1936, No. 537, 18 pp.).—*Locoine* is isolated from EtOH extracts of the plant by pptn. with phosphotungstic acid after clearing with basic Pb acetate. It is a basic substance (8.8% N; *tartrate*, *citrate*, *oxalate*, and *chloride* described), forms an *Ac* derivative, and in some respects resembles but probably is not an alkaloid. It contains no Se. Toxicity trials with cats are recorded. A. G. P.

**Variations in the effects of novocaine and morphine citrates on the nerves in an electrolyte-free medium according to differences in the concentration.** J. REGNIER and Q. QUEVAUVILLER (Compt. rend. Soc. Biol., 1937, 125, 627–629).—The activity of the citrates is 0.2–0.1 of that of the hydrochlorides. H. G. R.

**Action of strychnine on salivary digestion.** G. PARISINI (Arch. Farm. speriment., 1937, 63, 114–116).—The amylolytic activity of saliva *in vitro* is increasingly inhibited by concns. of strychnine decreasing down to  $1:5 \times 10^{-4}$ ; further dilution reduces the inhibitory effect whilst concns. of  $1:5 \times 10^{-5}$  have a slight accelerating action. F. O. H.

**Pharmacological action of tylophorine, the alkaloid occurring in *Tylophora asthmaticus*.** R. N. CHOPRA, N. N. DE, and M. CHAKARBURTY (Indian J. Med. Res., 1935, 23, 263–269). R. N. C.

**Action of arasaponins A and B.** K. K. CHEN and T. Q. CHOU (Proc. Soc. Exp. Biol. Med., 1937, 36, 394–396).—The saponins of *Gynura pinnatifida* have a hæmolytic action on some animals. H. G. R.

**Peristaltic activity of senna leaves and their active constituents.** W. STRAUB and E. TRIENDL (Arch. exp. Path. Pharm., 1937, 185, 1–19).—Extract of senna leaves is active when administered parenterally, intramuscularly, or intravenously, the period before action on the large intestine varying from 8 hr. to 30 min. During this period, enzymic degradation of the glucoside occurs, followed by oxidation of the anthranol to the anthraquinone, the latter being probably the active substance and the glucoside the more sol. and more absorbable form. The mechanism and type of action on the intestine are discussed. P. W. C.

**Methyl chloride (refrigerator) gas poisoning.** A. WEINSTEIN (J. Amer. Med. Assoc., 1937, 108, 1603–1605).—The danger of poisoning by the refrigerant MeCl is enhanced by its non-irritating, odourless nature. E. M. W.

Effects of lactic, pyruvic, succinic, fumaric, and glycerophosphoric acids on the activity of frog muscle and heart poisoned with bromoacetic acid. K. GRIMLUND (Skand. Arch. Physiol., 1936, 73, 109—122; Chem. Zentr., 1936, i, 3537).—After addition of lactic acid and  $\text{AcCO}_2\text{H}$  the poisoned muscles performed more mechanical work and showed higher respiration than in the absence of the donors. Succinic, fumaric, and glycerophosphoric acids had no action on intact sartorius, probably because they cannot penetrate, but produced positive effects in, punctured muscle. A. G. P.

Cumulative action of sublimate, strychnine, and arsenious acid on cultures of iris epithelium *in vitro*. K. SAITO (Folia Pharmacol. Japon., 1935, 21, 192—206).—Growth is accelerated by dil. solutions of these drugs but ceases later owing to cumulative effects. CH. ABS. (p)

Rapid detection of acute poisoning with mercury, arsenic, or lead. S. MIHAELOFF (Bull. Soc. Chim. biol., 1937, 19, 757—759).—A simplification of Reinsch's method, using strips of Cu foil, is described for determination of Hg, As, or Pb in material vomited or evacuated by cases of suspected poisoning by these metals. P. W. C.

Toxicity tests of novarsenobenzene in white mice bred in India. J. TAYLOR and M. L. AHUJA (Indian J. Med. Res., 1935, 23, 91—94).—The dose recommended for the standard test is 0.3 mg. per g. wt., the animals being more susceptible than English-bred animals. R. N. C.

Fate of mercury fumes and mercurial compounds in the organism. I. GELMAN and G. DERVIZ (J. Ind. Hyg., 1937, 19, 215—224).—Hg fumes persist for a time in the blood in a state of at. dispersion whilst Hg salts form complexes with the blood-proteins. Clinical differentiation of the two forms of poisoning is discussed. F. O. H.

Action of thallium on the teeth. III. Effect on the chemical composition. IV. Pathological changes. S. URABE (Acta dermatol., 1936, 27, 87—97, 98—107).—III. Administration of Tl acetate increases the proportion of org. matter in the teeth of rats and decreases that of inorg. The Ca content is increased very slightly by small doses of Tl and decreased by larger doses. The P and Mg contents are not much affected.

IV. Large, or repeated small, doses of Tl acetate cause degenerative changes in the teeth but single small doses have no effect. NUTR. ABS. (m)

Glutathione in the blood of dogs during chronic poisoning with cyanides. N. RENESCU and I. POTOR (Compt. rend. Soc. Biol., 1937, 125, 201—204).—The val. decreases and then fluctuates during the course of the intoxication. H. G. R.

Glycogen content of liver cells after ingestion of unusual or toxic substances. J. SABRAZES, R. DE GRAILLY, and P. DERVILLÉE (Compt. rend. Soc. Biol., 1937, 125, 645—648).—Glycogen is reduced by adding EtOH and  $\text{CHCl}_3$ , raw mutton juice, or raw egg-yolk to the diet of rabbits. H. G. R.

Filtration studies on pyrogenic inulin. C. TUI, M. H. SCHRIFT, K. L. McCLOSKEY, and A. L. YATES (Proc. Soc. Exp. Biol. Med., 1937, 36, 227—230).—The substance causing the febrile reaction in certain samples of inulin (cf. A., 1936, 1551) is removed when the aq. solution is filtered through a suitable Zsigmondy ultrafilter membrane or through two Seitz No. 3 pads. W. O. K.

Toxicant occurring naturally in certain samples of plant foodstuffs.—See B., 1937, 725.

Digestive enzymes in the southern army worm. F. H. BABERS and P. A. WOKE (J. Agric. Res., 1937, 54, 547—550).—Amylase, maltase, glycogenase, invertase, rennin, lipase, trypsin, and erepsin occur in the digestive tract. The presence of raffinase is doubtful. Lactase, cellulase, emulsin, and pepsin were not detected. The distribution of the enzymes in the various sections of the tract is examined. A. G. P.

Enzymes of some wood-rotting *Polypores*. S. R. BOSE and S. N. SARKAR (Proc. Roy. Soc., 1937, B, 123, 193—213).—A large no. of carbohydrases, together with small quantities of lipolytic and proteolytic enzymes, were found. The concn. of extracellular was > that of intracellular enzymes and the activity was greatest in the vegetative stage. H. G. R.

Placental enzymes. Succino-dehydrogenase and glycerophosphate-dehydrogenase. D. P. DA CUNHA (Compt. rend. Soc. Biol., 1937, 125, 549—551).—These enzymes are present in the placenta but to a smaller extent than in ox muscle. H. G. R.

Influence of heavy metals on enzyme reactions in milk. W. RITTER (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, 11, 297—306).—The actions of the Schardinger enzyme and xanthine dehydrogenase are retarded by small amounts of Cu gaining entry into milk at low pasteurisation temp. Small amounts of Cu give a positive reaction for peroxidase in milk in which the native peroxidase has been destroyed by high-temp. treatment. Small amounts of  $\alpha\text{-C}_{10}\text{H}_7\cdot\text{OH}$ ,  $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{NMe}_2$ , and  $\text{H}_2\text{O}_2$  counteract the oxidising catalytic effect of Cu in milk, cream, and butter. Cu is the only metal causing oxidised flavour. The heating of milk to pasteurisation temp. lowers the susceptibility to oxidised flavour, which is not due to enzyme destruction but to the formation of antioxygens. Fishiness in butter is similarly suppressed. W. L. D.

Oxidation of tyramine in the liver. F. J. PHILPOT (Biochem. J., 1937, 31, 856—861).—Xanthine oxidase is not concerned at any stage in the oxidation of tyramine (I). (I) oxidase is an aerobic oxidase which is strongly inhibited by methylene-blue, the redox potential of the system lying between  $-0.046$  and  $+0.195$  volt. Using liver slices, 1 atom of O was absorbed per mol. of (I) and complete deamination occurred, suggesting the conversion into  $p\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CH}_2\cdot\text{CHO}$ . P. W. C.

Dehydrogenases of *B. coli*. IV. Lactic dehydrogenase. J. YUDKIN (Biochem. J., 1937, 31, 865—868; cf. A., 1934, 221, 1264).—Dilution of

suspensions of *B. coli* causes a considerable decline in activity of lactic acid dehydrogenase (I) due to the presence of a heat-stable co-enzyme which is replaceable by yeast cozymase. Similar results were obtained with cell-free preps. of (I). The affinities for lactate of (I) of intact cells and the sol. prep. show slight but const. differences.

P. W. C.

**Effect of ascorbic acid on the oxidases of succinic acid and *p*-phenylenediamine.** A. I. JAKOVTSCHUK (Bull. Biol. Med. exp. U.R.S.S., 1936, 2, 198—199).—The  $O_2$  uptake of washed muscle or of liver in a substrate containing succinic acid or  $p\text{-C}_6\text{H}_4(\text{NH}_2)_2$  is not increased by the presence of ascorbic acid (I). (I) does not increase the  $O_2$  uptake of washed muscle in the absence of oxidases.

NUTR. ABS. (m)

**$\beta$ -Hydroxybutyric dehydrogenase of animal tissues.** D. E. GREEN, J. G. DEWAN, and L. F. LELoir (Biochem. J., 1937, 31, 934—949).—The prep. and properties of  $\beta$ -hydroxybutyric dehydrogenase (I) of heart muscle are described. Co-enzyme I (II) (diphosphopyridine nucleotide) is an indispensable component of the system. Evidence is presented for the existence of a co-enzyme oxidase which catalyses oxidation of reduced (II) by  $O_2$ . (I) specifically catalyses the oxidation of *l*- $\beta$ -hydroxybutyrate to acetoacetate, the product being isolated as  $\text{COMe}_2$  dinitrophenylhydrazone. The reversibility of this change is demonstrated potentiometrically. The  $E_0'$  at  $p_H$  7 is  $-0.282$  volt. The free energy change was calc. to be 6920 g.-cal. (I) is similar in general properties to lactic and malic dehydrogenase.

P. W. C.

**Respiration of ocular tissues.** D. MICHAEL and P. VANCEA (Compt. rend. Soc. Biol., 1937, 125, 185—188).—The corneal, crystallin, and lachrymal oxidases are stimulated by insulin, adrenaline, ascorbic acid, and X-rays.

H. G. R.

**Action of cyanide and pyrophosphate on dehydrogenases.** L. F. LELoir and M. DIXON (Enzymologia, 1937, 2, 81—88).—No dehydrogenase except xanthine dehydrogenase is inactivated after incubation with  $\text{CN}^-$ .  $\text{P}_2\text{O}_7^{4-}$  strongly inhibits succinic dehydrogenase (I) but no others tested. Inhibition of respiration by  $\text{P}_2\text{O}_7^{4-}$  is probably due to the inhibition of (I) alone. (I) probably plays an important part in the respiration of animal tissues. Dehydrogenase preps. from yeast contain an enzyme which destroys cozymase within 10 min.

E. A. H. R.

**Dissociation constants and reactivity of acet-aldehyde reductase.** E. NEGELEIN and H. J. WULFF (Biochem. Z., 1937, 290, 445—446).—The union of protein with diphosphopyridine nucleotide in this reductase and the reactivity of the enzyme are measured.

P. W. C.

**Action of alcohols on catalase.** N. T. DELEANO and L. ULLMANN (Bull. Soc. Chim. biol., 1937, 19, 130—136).—The actions on plant catalase give an order of descending toxicity of MeOH, amyl alcohol, EtOH,  $\text{Pr}^i\text{OH}$ , and  $\text{Bu}^i\text{OH}$ .

F. O. H.

**Catalase activation in living cells.** IV. K. YAMAFUJI (Enzymologia, 1937, 2, 99—104; cf. A.,

1936, 1296).—An emulsion obtained from young yeast cultures contains a thermostable activator of yeast catalase (I). The same activator occurs in dried baker's yeast and in silkworm eggs. (I) activity of silkworm eggs is also increased by a preliminary treatment with a boiled extract either of yeast or of silkworm eggs.

E. A. H. R.

**Catalase in the  $F_1$  generation.** K. YAMAFUJI and S. GOTO (Enzymologia, 1937, 2, 105—106).—Blood-catalase of *Bombyx mori* in the  $F_1$  generation approximates to the mean val. of the two parents.

E. A. H. R.

**Influence of the nature of the organic solvent on the activity of esterase.** E. A. SYM (Enzymologia, 1937, 2, 107—109).—The rate of production of Bu and cetyl butyrates in the presence of dry pancreatic esterase is greater in non-polar than in polar solvents, and falls with increasing vals. of the dipole moment. Similar results could not be established for the esterification of glycerol by  $\text{PrCO}_2\text{H}$  and oleic acid (I) or of cetyl alcohol by (I).

E. A. H. R.

**Choline-esterase in lizard's muscle.** A. MARINAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 489—490).—The muscle of *Lacerta viridis* contained approx. twice as much choline-esterase as mammalian muscle (guinea-pig or cat).

H. G. R.

**Effects of saponin and digitonin on lipase and phosphatase action.** B. S. GOULD (Proc. Soc. Exp. Biol. Med., 1937, 36, 290—292).—Saponin markedly inhibits pancreatic lipase and except in high concn. has little effect on blood-lipase. It has no appreciable influence on phosphatase preps. even in a concn. of 150 mg. per 100 c.c.

P. G. M.

**Increase in the esterase content of the blood after oral administration of ascorbic acid.** J. MOSTERS (Klin. Woch., 1936, 15, 1557—1560).—The blood-esterase activity but not the lipase activity of human patients is increased by oral administration of ascorbic acid.

NUTR. ABS. (m)

**Enzymic activity and surface tension.** Action of some surface-active substances on pancreatic lipase. E. TRIA (Atti R. Accad. Lincei, 1937, [vi], 23, 372—380).—The activity of pancreatic lipase on tributyrin in presence of varying amounts of Na oleate, Na salts of bile acids, or isoamyl alcohol reaches a max. when  $\sigma$  of the system is 38—40 dynes.

E. W. W.

**Racemiasse, an enzyme which catalyses racemisation of lactic acid.** H. KATAGIRI and K. KITAHARA (Biochem. J., 1937, 31, 909—914).—*Staphylococcus ureæ* was the only micro-organism of 30 species tested which produced racemiasse. *Leuconostoc* (*l*-former) and *Lactobacillus plantarum* (*dl*-former) always produced sp. forms of lactic acid but remarkable modification of the acid isomeride formed was obtained with *Lactobacillus sake* (*d*-, *dl*- and *dl*- + *d*-former) by variation of the cultural conditions. This modification is probably due to racemiasse in the bacterial cells.

P. W. C.

**Effect of heavy water on the hydrolysis of urea by urease.** W. BRANDT (Biochem. Z., 1937, 291, 99—104).—At  $25^\circ$   $\text{NH}_2\cdot\text{CO}_2\text{NH}_4$  is completely hydrolysed in  $\text{H}_2\text{O}$  or  $\text{D}_2\text{O}$  in 1 hr. whether or not urease

(I) is present. The conversion of  $\text{NH}_4\text{CNO}$  into urea proceeds equally rapidly in  $\text{H}_2\text{O}$  and  $\text{D}_2\text{O}$  whether or not (I) is present but the hydrolysis of urea by (I) proceeds much more rapidly in  $\text{H}_2\text{O}$  than in  $\text{D}_2\text{O}$  possibly because  $\text{D}_2\text{O}$  inhibits the interaction of substrate and enzyme or because decomp. of the enzyme-substrate compound is catalysed by  $\text{D}^+ < \text{by H}^+$ .  
W. McC.

**Urease. VII. Effect on urease of certain elements of the 2nd, 4th, 5th, and 7th groups of the periodic system.** A. A. RUCHELMAN (Ukrain. Biochem. J., 1937, 10, 5—22).— $\text{HgO}$ ,  $\text{MnO}_2$ ,  $\text{Zn}$ , and  $\text{ZnO}$  have no action on urease (I).  $\text{Sb}$  very slightly activates or inactivates (I) according to the experimental conditions, whilst  $\text{Pb}$  has an activating effect over a considerable range of  $[\text{Pb}]$ . The mechanism of the (I) action is discussed on the assumption that (I) is an ampholyte with a free  $\text{CO}_2\text{H}$  and  $\text{NH}_2$  group.  
W. O. K.

**Spectrographic experiments in the urease-urea system.** K. G. STERN and K. SALOMON (Enzymologia, 1937, 2, 96—98).—The absorption spectrum of cryst. urease (I) between 2480 and 4000 Å. remains unchanged on the addition of an amount of urea sufficient to saturate (I). Tyrosine residues in (I) probably do not participate in the formation of an enzyme-substrate complex.  
E. A. H. R.

**Problematical existence of "ammoniacases."** K. P. JACOBSON and M. SOARES (Compt. rend. Soc. Biol., 1937, 125, 554—556).—No elimination of  $\text{NH}_3$  was observed from phenylalanine, tyrosine, dihydroxyphenylalanine, or histidine with *B. coli* enzymes.  
H. G. R.

**Arginase.** E. J. RASCHBA (Ukrain. Biochem. J., 1937, 10, 143—168).—A review.  
W. O. K.

**Carboxypeptidase. I. Preparation of crystalline carboxypeptidase.** M. L. ANSON (J. Gen. Physiol., 1937, 20, 663—669).—Extended details of the method already reported (A., 1935, 897) are given.  
F. A. A.

**Protease secretion of gelatin-liquefying bacteria.** G. GORRACH and E. PRICH (Enzymologia, 1937, 2, 92—95).—The protease (I) found in culture media of gelatin-liquefying bacteria is a product of the autolysis of dead bacteria. Casein is not a suitable substrate for the (I) of *B. fluorescens liquefaciens*.  
E. A. H. R.

**Proteolytic enzymes. XV. Intracellular proteolytic enzymes.** M. BERGMANN, J. S. FRUTON, and H. FRAENKEL-CONRAT (J. Biol. Chem., 1937, 119, 35—46; cf. this vol., 269).—If papain-I be removed from a gelatin-papain system by  $\text{NHPH}\cdot\text{NH}_2$  (I), papain-II is automatically activated. Subsequent addition of  $\text{PhCHO}$  regenerates -I, but an inactive enzyme solution is formed, the two partial enzymes almost completely inactivating each other. Activation of papain is considered to be a dissociation of the proteolytically inactive holopapain (compound of -I with -II) into active -I and -II. -II which has been activated by (I) is not further activated by  $\text{HCN}$ . Addition of  $\cdot\text{SH}$  compounds to -I inactivated by (I) regenerates active -I. In absence of activators, papain attacks gelatin and its first degradation

products only. Liver-cathepsin consists of cathepsin-I and -II which are quite comparable with papain-I and -II in their behaviour towards (I). Bromelin is also a dual enzyme, the relationship between the two components being essentially similar to that with papain or cathepsin. The three I-enzymes show great sp. differences.  
J. N. A.

**Enzymic production of hydrogen sulphide from organic sulphur derivatives.** C. FROMAGEOT and R. MOUBACHER (Enzymologia, 1937, 2, 121—128).—*B. coli communis* in the resting state, or an enzyme prep. obtained by treating the bacteria successively with  $\text{COMe}_2$  and  $\text{Et}_2\text{O}$ , causes the decomp. of cystine (I) and cysteine (II) with liberation of  $\text{H}_2\text{S}$  (or possibly of mercaptans). The decomp. occurs only in the presence of glucose (III),  $\text{HCO}_2\text{Na}$ , or  $\text{NaOAc}$ .  $\text{PhMe}$  completely inhibits the formation of  $\text{H}_2\text{S}$  without affecting the decomp. of (III). In the decomp. of (II) there is no accompanying decarboxylation or deamination. There is no optical specificity in the action on (I). Glutathione and thiolpropionic acid undergo a similar decomp. but the presence of (III) is not essential. Methionine and taurine are unaffected. Similar decomps. are not effected by yeast preps. The name desulphurase is suggested for the enzyme.  
E. A. H. R.

**Degradation of starch by amylase.** A. TYCHOWSKI (Biochem. Z., 1937, 291, 138—158).— $\beta$ -Amylase (I) rapidly hydrolyses starch (potato, wheat, rye, barley, maize, rice) until the yield of maltose (II) is approx. 60%, the effect being independent of temp. and of the concns. of (I) and (II). Subsequently the hydrolysis proceeds very slowly. Hydrolysis with  $\alpha$ -amylase (III) + (I) proceeds rapidly until the yield of (II) is approx. 68% and then more slowly until the yield is 70—75%, the rate increasing with increasing temp. and with increasing concn. of (I) + (III), but being independent of the (II) concn. (II) is the only sugar produced. When hydrolysis with (I) is complete the material not converted into (II) consists of non-reducing dextrins (IV) not attacked by (I). (IV) are partly converted into (II) by (I) + (III) and partly into reducing (IV). The constituent of starch easily and completely hydrolysed by (I) should be termed amylose, the other constituent being termed amylopectin.  
W. McC.

**Biochemistry of varieties of Bengal rice. III. Enzymic digestibility of rice starch and protein: action of salivary and pancreatic amylase, pepsin, and trypsin.** K. P. BASU and S. MUKHERJEE (Indian J. Med. Res., 1936, 23, 777—787).—Starch (I) from Aman varieties of rice is digested more readily by salivary amylase than (I) from Aus varieties, but less readily by pancreatic amylase. Proteins (II) from Aman varieties are digested more readily by pepsin (III) and trypsin (IV) than (II) from Aus varieties; (III) is more active than (IV) with both varieties. The individual varieties of each group show variations. Parboiling increases the digestibility of (I) and (II) in both varieties. Polishing increases the digestibility of (I), but has very little effect on (II). Non-polished coloured varieties are scarcely affected by (IV), but hydrolysed readily by (III).  
R. N. C.

**Enzymic digestibility of pulses: action of salivary and pancreatic amylase and of the proteolytic enzymes pepsin and trypsin.** K. P. BASU and S. MUKHERJEE (Indian J. Med. Res., 1936, 23, 827—830).—The pulse proteins are hydrolysed more readily by trypsin (I) than by pepsin (II). Lentil protein is most readily hydrolysed by either enzyme; gram protein is the most resistant to (II), and green-gram to (I).  $\text{NH}_2$ -acid production from rice protein by either enzyme after 3 hr. is of the same order as from pulse protein, although the amount of protein in rice is  $<$  in pulses. The rate of digestibility of soya-bean protein is of the same order as of pulse protein. Lentil starch is most readily digested by salivary amylase. The starches of the cereals examined are digested with equal readiness by pancreatic amylase, except gram and green-gram starch, which are more resistant.

R. N. C.

**Diastatic activity of orange leaves as affected by time, temperature,  $p_{\text{H}}$ , and certain zinc salts.** W. B. SINCLAIR and E. T. BARTHOLOMEW (J. Agric. Res., 1937, 54, 609—619).—The diastatic activity is not affected by  $p_{\text{H}}$  within the range 4.0—5.4. Max. activity occurs at 60—65°, young leaves being relatively more active than the old. Starch in leaves is probably bound to the chloroplast and is not readily acted on by leaf-diastase (I). Added taka-diastase (II) hydrolyses leaf-starch in macerated tissue. Starch solutions are hydrolysed by (I). Addition of 30 milliequivs. of Zn (as  $\text{ZnCl}_2$ ,  $\text{ZnSO}_4$ ) per litre of substrate permitted quant. conversion of leaf-starch into glucose by (II), and did not inhibit the action of (I).

A. G. P.

**Influence of colloids and electrolytes on the equilibrium under the action of maltase.** D. MICHLIN and P. KOLESNIKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 199—201).—The synthesis of maltose by maltase is increased by 20—30% on adding small amounts of protein.  $\text{SO}_4^{--}$  also increases the extent of, and  $\text{NH}_4\text{CNS}$  completely inhibits, synthesis, these salts probably acting through their effect on the protein.

P. W. C.

**Emulsin. XXIX. Simultaneous fission of several substrates.**  $\beta$ -*D*-Galactosidase of emulsin from sweet almonds. B. HELFERICH and W. GÖLLER (Z. physiol. Chem., 1937, 247, 220—224; cf. A., 1937, II, 178).—Hydrolysis of *n*-butyl- $\beta$ -*D*-glucoside by sweet-almond emulsin is not diminished by the simultaneous hydrolysis of admixed phenyl- $\beta$ -*D*-glucoside or *m*-tolyl- $\beta$ -*D*-galactoside; the latter hydrolyses are, however, retarded. The presence of distinct enzymes for the hydrolysis of  $\beta$ -*D*-glucosides and -galactosides in the emulsin prep. is unlikely.

F. O. H.

**Existence of different invertases.** L. AMBARD and S. TRAUTMANN (Compt. rend. Soc. Biol., 1937, 125, 133—135).—Variations have been observed in the rate at which sucrose is inverted by invertase from different sources.

H. G. R.

**Determination of the constitution of cozymase; isolation of adenosinediphosphoric acid as product of fission.** R. VESTIN, F. SCHLENK, and H. VON EULER (Ber., 1937, 70, [B], 1369—1374).—

Alkaline hydrolysis of cozymase gives a product which is chemically and biologically identical with adenosinediphosphoric acid. The presence of the pyrophosphate linking in the cozymase mol. is thus established.

H. W.

**Rôle of cozymase in lactic acid formation in muscle extract.** O. MEYERHOF and P. OHLMEYER (Biochem. Z., 1937, 290, 334—353).—Details of previously published work are given (this vol., 69).

P. W. C.

**Cozymase and cophosphorylase.** I. Coenzyme of phosphorylation. II. Differentiation of codehydrase and cophosphorylase. H. VON EULER, E. ADLER, G. GUNTHER, H. HEIWINKEL, and R. VESTIN (Arkiv Kemi, Min., Geol., 1937, 12, B, No. 24, 6 pp.; No. 25, 7 pp.).—I. The impurity associated with cozymase (I) responsible for its powers as a  $\text{PO}_4^{--}$  carrier, and also produced by alkali-inactivation of pure (I), is probably different from adenylic acid (II). The name cophosphorylase is proposed.

II. Alkali-inactivated (I), but not pure (I), can replace (II) in systems in which (II) functions as a  $\text{PO}_4^{--}$  carrier.

E. A. H. R.

**Cozymase and dihydrocozymase in extracts of animal tissues.** J. ŠULA (Arkiv Kemi, Min., Geol., 1937, 12, B, No. 28, 5 pp.).—The cozymase (I) and dihydrocozymase (II) contents of tissues were determined by taking advantage of the relative stabilities of (I) and (II) in acid and alkaline solutions. In extracts of muscle, liver, kidney, erythrocytes, and heart, (II) is always present in addition to (I).

E. A. H. R.

**Enzymic synthesis of cocarboxylase from vitamin- $B_1$  and phosphate.** H. VON EULER and R. VESTIN (Naturwiss., 1937, 25, 416).—Cocarboxylase is formed if a dried yeast prep. is incubated with a mixture of inorg. P, Na adenosinetriphosphate (or hexose diphosphate), and aneurin hydrochloride. The synthesis is incomplete. Rat liver can replace the yeast.

E. A. H. R.

**Animal phosphatases. VII. Activation of phosphatases by magnesium.** E. BAMANN and W. SALZER (Ber., 1937, 70, [B], 1263—1270; cf. A., 1936, 1298).—Reasons are advanced for considering the action of  $\text{Mg}^{++}$  towards animal phosphatases to be a true activation. The processes which occur are complex and the experimental data do not at present justify the assumption of changes in affinity of substrate to enzyme by  $\text{Mg}^{++}$ . The optimal  $\text{Mg}^{++}$  concn. depends mainly on the condition of the enzyme. Experiments with  $\alpha$ - and  $\beta$ -glycerophosphoric acid show that the ratio,  $\alpha$ -:  $\beta$ -rate of hydrolysis, by an enzyme of the same origin is subject to greater or less fluctuation according to the condition of the enzyme and the accidental  $\text{Mg}^{++}$  content of the solutions.  $\text{Ca}^{++}$  alone in absence of  $\text{Mg}^{++}$  is without appreciable effect on the activity of "alkaline" phosphoesterase; in the same concn. it causes considerable restriction in solutions activated by  $\text{Mg}^{++}$ .

H. W.

**Phosphatases of liver. Phosphomonoesterases and phosphodiesterase.** J. ROCHE and M.

LATREILLE (Compt. rend. Soc. Biol., 1937, 125, 470—472).—A method for prep. of phosphomonoesterase free from phosphodiesterase is described.

H. G. R.

**Specificity of the phosphatases.** Phosphomonoesterase  $A_1$ . J. ROCHE and M. LATREILLE (Compt. rend. Soc. Biol., 1937, 125, 472—474).—Phosphomonoesterase  $A_1$  is a mixture of enzymes sp. for  $\alpha$ - and  $\beta$ -glycerophosphoric acids and monophenylphosphoric acid.

H. G. R.

**Effect of physiologically important materials on kidney-phosphatase.** J. J. PYLE, J. H. FISHER, and R. H. CLARK (J. Biol. Chem., 1937, 119, 283—288).—Vitamin-C,  $\text{PrCO}_2\text{H}$ , and cystine produced inhibition, and creatine and creatinine activation, of the enzyme. Vitamin-A and -D, insulin, tyrosine, and many other  $\text{NH}_2$ -acids etc. have no effect.

P. G. M.

**Specific phosphatase of nervous tissue.** J. REIS (Enzymologia, 1937, 2, 110—116).—Nervous tissue contains, in addition to the normal phosphatase (I), another phosphatase, termed 5-nucleotidase (II), which has a sp. action on adenylic and inosic acids. (II) has optimal activity at  $p_{\text{H}}$  7.0—7.5. The effect of Mg on (II) is  $\ll$  on (I). (II) occurs in the white and grey substances of the brain and the spinal cord, in peripheral nerve, and (richest) in the retina. The sp. nature of (II) is not connected with the primary or sec. character of the alcohol group to which the  $\text{H}_3\text{PO}_4$  is attached.  $\alpha$ - and  $\beta$ -Glycerophosphates can be distinguished by the ability of the former to form a sol. blue-violet complex with  $\text{Cu}^{++}$  in alkaline solutions.

E. A. H. R.

**Comparative hydrolysis of  $\alpha$ - and  $\beta$ -glycerophosphoric acids by vegetable phosphatases.** III. Action of arsenates and fluorides on taka-diastase. IV. Effect of enzyme concentration on the affinity for substrate. J. COURTOIS (Bull. Soc. Chim. biol., 1937, 19, 303—316, 317—320; cf. A., 1936, 111).—III. The inhibition of the hydrolysis of  $\alpha$ - (I) and  $\beta$ -glycerophosphate (II) at  $p_{\text{H}}$  4.5 by  $\text{Na}_2\text{HASO}_4$  and  $\text{NaF}$   $\propto$  the concn. of the inhibitor and varies inversely with the substrate concn. (II) is always hydrolysed more rapidly than (I), and the inhibitors have little effect on the fixation of the substrates by the enzyme.

IV. The affinity of the phosphatases in taka-diastase and in the seeds of white mustard and sweet almonds towards (I) and (II) is independent of the enzyme concn.

A. L.

**Free protein component of the yellow enzyme and its coupling with lactoflavinphosphoric acid.** H. THEORELL (Biochem. Z., 1937, 290, 293—303).—The protein component (I) of the yellow respiratory enzyme (II) is pptd. by 50—100% saturation with  $(\text{NH}_4)_2\text{SO}_4$  and the isoelectric point is  $p_{\text{H}}$  5.78. In (I), lactoflavinphosphoric acid (III) is probably coupled with (I) through one OH of the  $\text{H}_3\text{PO}_4$  radical of (III) (the second OH remaining free) to a basic group of (I) and also through the NH of (III) to an acidic group of (I). The union of (III) and (I) is a reversible process as is also the ready inactivation of (I) by conversion into metaprotein. The irreversible inactivation of (I) by heat is investigated.

P. W. C.

**The yellow enzyme.** F. WEYGAND (Chem.-Ztg., 1937, 61, 545—548).—A review. E. A. H. R.

**Preparation of yellow enzyme from yeast by an adsorption process.** F. WEYGAND and H. STOCKER (Z. physiol. Chem., 1937, 247, 167—171).—The enzyme is adsorbed from yeast preps. at  $p_{\text{H}}$  7 by  $\text{Al}(\text{OH})_3$  or  $\text{Fe}(\text{OH})_3$  and eluted by 2% aq.  $\text{Na}_2\text{HPO}_4$  or  $(\text{NH}_4)_2\text{HPO}_4$ , the eluate being then treated with saturated aq.  $(\text{NH}_4)_2\text{SO}_4$  (2 vols.). The ppt. is dissolved and, after dialysis, the solution is re-treated by the adsorption process.

F. O. H.

**Decomposition of yeast-nucleic acid by a heat-resistant enzyme.** R. J. DUBOS (Science, 1937, 85, 549—550).—Preps. which exhibit high enzymic activity on yeast-nucleic acid (I) have been obtained. The enzyme has been prepared from polymorphonuclear leucocytes and especially from the liver, pancreas, spleen, and lungs of different animal species. It is very resistant to heat, with max. stability at  $p_{\text{H}}$  4—5. The rate of action on (I) increases with temp. up to  $75^\circ$ , and then decreases rapidly to zero at  $85^\circ$ . The inhibiting effect of the higher temp. is reversible. The enzyme appears to be a protein, and is rapidly decomposed by pepsin, but is resistant to trypsin and chymotrypsin. It does not behave as a phosphatase, and has no action on thymus-nucleic acid. After the action of this polynucleotidase, (I) is sol. in mineral acids and in glacial  $\text{AcOH}$ . Several samples of cryst. trypsin and chymotrypsin contained small amounts of a heat-resistant substance which attacks (I) and heat-killed pneumococci.

L. S. T.

**Production of sterol by yeast.** F. REINDEL, K. NIEDERLANDER, and R. PFUNDT (Biochem. Z., 1937, 291, 1—6).—During the production of yeast by the method of Braun and Pfundt (B., 1937, 76) the amount of sterol present increases five-fold when the N source is inorg. and six-fold when it is org.

W. McC.

**Fat and lipin metabolism of yeast.** V. F. BILGER, W. HALDEN, E. MAYER-PITSCH, and M. PESTEMER (Monatsh., 1937, 70, 259—272).—The ergosterol (I) content of certain types of yeast can be determined by means of ultra-violet absorption analysis. Protracted resting of yeast increases the content of (I) and of total sterols (II) 2- or 3-fold. In beer yeast enriched in lipins the proportion of (I) in (II) is always  $<$  in the untreated material. The max. vals. of (I) are obtained from nutrient containing bottom yeast by use of maltose. The relative enrichment in (II) is considerably less with distillery than with brewer's yeast under the conditions employed. In the course of lipin enrichment a steady increase in (I) content is observed which is less marked than that of the other sterols;  $\text{CH}_2\text{I}-\text{CO}_2\text{H}$  restricts the biological synthesis of (II) and consequently of (I).

H. W.

**Trehalose and yeast.** II. Trehalose action of yeast preparations. K. MYRBACK and B. ÖRTENBLAD (Biochem. Z., 1937, 291, 61—69; cf. this vol., 70).—Pressed yeast does not ferment the 10% of trehalose (I) which it contains but ferments added (I). After drying, the yeast ferments its own and added (I). When a suitable poison is present pressed yeast hydrolyses (I) without fermentation. Probably, in

the cell, (I) is separated from trehalase (II) which exhibits optimal action at  $p_H$  5—6. (II) of top yeast exists in insol. form in the cell and is more stable than maltase. (II) of bottom yeast is less stable than (II) of top yeast and (II) of Lebedev's yeast-juice is very unstable. The action of (II) is inhibited by NaF. Probably (I) is not directly fermented but converted first into glucose.

W. McC.

**Role of phosphates in oxidative processes.**  
**VII. Activation of growth of yeast by phosphates.** A. MALKOV and A. MESONSHIK (Ukrain. Chem. J., 1937, 12, 153—168).—The rate of multiplication of yeast cells is greatly increased by treatment with aq. phosphate (5.4%  $P_2O_5$ ) for 90 min. at  $p_H$  8.15, before placing in the nutrient medium. The effect is ascribed to formation of non-ionised complexes with intra- and extra-cellular Fe, leading to lowering of oxidative processes during the early stages of growth. The complexes gradually break down, liberating highly active Fe, as a result of which the metabolic activity of the cells is maintained at a high level over a long time.

R. T.

**Mechanism of the lethal effect of high pressures on cells. Intensity and duration of lethal pressures with yeast.** B. LUYET (Compt. rend., 1937, 204, 1214—1215).—Curves are given for the time-mortality effect of high pressures on *S. cerevisiae* (e.g., for 100% mortality, approx. 10 and 2 min. are required for pressures of 5000 and 6500 atm., respectively). The last 10% of the cells are most resistant.

F. O. H.

**Cellular death at high pressures. Similarity between the action of heat and pressure on yeast.** B. LUYET (Compt. rend. Soc. Biol., 1937, 125, 403—405).—The effects of heat and high pressure are similar and additive.

H. G. R.

**Effect of ultra-violet rays on the alcoholic fermentation of *Saccharomyces cerevisiae*.** I. II. V. GRONCHI (Boll. soc. ital. Biol. sperim., 1933, 2, 957—960, 961—963; Chem. Zentr., 1936, i, 3351).—I. The activity of yeast is stimulated by the long rays of the Wood lamp. Repeated exposures give best results.

II. The action on yeast is influenced by the  $\lambda$  of the rays and the period of exposure. Short  $\lambda\lambda$  retard fermentation.

A. G. P.

**Open system respirometer for study of gaseous metabolism of micro-organisms.** S. E. DONOVICK and T. D. BECKWITH (J. Bact., 1937, 33, 291—306).—Apparatus is described. The  $O_2$  consumption of *Saccharomyces cerevisiae* at 24 hr. was  $0.18 \times 10^{-12}$  and at 36 hr.  $0.28 \times 10^{-12}$  mol. per cell per hr.  $CO_2$  production (gaseous) gave less uniform results. The causes of this are discussed.

A. G. P.

**Reaction of the medium and activity of ordinary and *Aspergillus* pre-treated cultures.** V. BOLCATO (Ind. sacc. ital., 1935, 28, 454—459; Chem. Zentr., 1936, i, 3590—3591).—Gluconic acid is formed at  $p_H > 3.4$  and citric acid at  $p_H < 3.4$ ; these limits may be changed by use of an acid nutrient medium.

H. N. R.

**Action of potassium on metabolism.** O. KAUFFMANN-COSLA and R. BRULL (Bull. Soc. Chim. biol., 1937, 19, 137—143).—K<sup>+</sup> influences the growth of *Aspergillus niger* in Raulin's solution by selective catalytic action on the synthesis of cellulose and inhibitory action (antagonising the action of Fe) on the synthesis of lipins from carbohydrates. N metabolism is not affected.

F. O. H.

**Utilisation of amino-acids, polypeptides, and diketopiperazines in the growth of fungi.** Y. TAZAWA and S. YAMAGATA (Acta phytochim., 1937, 9, 299—310).—The influence of  $NH_2$ -acids, polypeptides, and diketopiperazines on the growth of *Aspergillus niger* and *A. oryzae* at  $p_H$  3.4 and 7.0 has been investigated.

H. W.

**Propagation of moulds.** A. VON SZILVINYI (Biochem. Z., 1937, 291, 7—20; cf. Kluyver and Hoogerheide, A., 1934, 1138).—There is no relation between the final oxidation-reduction potential attained in suspensions of the fungi and their power to propagate but the time required for the production of each generation decreases as the respiration increases. In suspensions of living yeast the potential depends on  $[O_2]$  if this is  $< 66.7\%$  but not if it is  $> 66.7\%$ .

W. McC.

**Mechanism of the formation of organic acids by mould fungi. II. Action of *Aspergillus niger* on glucose in the presence of sodium iodoacetate.** E. M. JOHNSON, E. C. KNIGHT, and T. K. WALKER (Biochem. J., 1937, 31, 903—908).—0.0013—0.001M- $CH_2I \cdot CO_2Na$  (I) introduced into glucose (II) solutions in contact with the fully developed mycelium of *A. niger* caused an increased (II) utilisation and acid production. 0.002M-(I) was just sufficient to prevent spore formation of 6 strains of *A. niger*, was sufficient to suppress EtOH formation by 5 strains in a  $N_2$  atm., but still permitted citric acid (III) formation to the same extent as in the absence of (I). With 0.002M-(I), (II) utilisation is, however, decreased and the % yield of (III) is greater in the presence than in the absence of (I). With 0.0021M-(I), (II) utilisation is decreased but the yield of (III) in respect to (II) utilised remains the same. 0.0025M-(I) does not entirely suppress formation of (III). The mechanism of formation of (III) is discussed (cf. A., 1932, 651).

P. W. C.

**Production of gallic acid from tannin, especially from theotannin, by *Aspergillus niger*.** W. B. DEYS and M. J. DIJKMAN (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 518—523).—Gallic acid (I) is produced when *A. niger* is grown on a decoction of fresh tea leaves or on a solution containing theotannin (II), sucrose, and inorg. salts. Addition of the enzyme of *A. niger* to aq. solutions of (II) caused liberation of (I).

J. N. A.

**Chitin in micro-organisms.** (A) A. RIPPEL. (B) R. S. HILPERT (Biochem. Z., 1937, 290, 444; 291, 216—218).—(A) The view expressed by Hilpert (this vol., 143, 160) that chitin is probably not formed by certain fungi is refuted.

(B) A reply.

P. W. C.

**Biochemical properties and experimental pathology of a pulmonary actinomyces (*Actino-***

*myces nitrogens*, nov. sp.). A. SARTORY, R. SARTORY, J. MEYER, and A. WALTER (Ann. Inst. Pasteur., 1937, 58, 684—708).—The organism, isolated from a human lung, is a facultative anaerobe, grows on media of  $p_H$  5.6—7.3, selectively attacks various sugars, has no proteolytic activity, and reduces  $NO_3^-$  to  $NO_2^-$  and  $N_2$ . W. O. K.

Metabolism of soil fungi.—See B., 1937, 715.

Isolation of a toxic substance from the culture filtrate of *Trichoderma*. R. WEINDLING and O. H. EMERSON (Phytopath., 1936, 26, 1068—1070).—The toxic substance  $C_{14}H_{16}O_4N_2S_2$  is strongly levorotatory, is non-basic, reduces alkaline  $KMnO_4$ , and yields  $H_2S$  with  $KOH$ . A. G. P.

Carbon metabolism of *Gibberella saubinetii* on glucose. L. E. HESSLER and R. A. GORTNER (J. Biol. Chem., 1937, 119, 193—200).—The principal products on media containing only glucose and inorg. matter are  $CO_2$  and  $EtOH$ ; tartaric and citric acids and  $AcOH$ , but no other volatile acid, could be demonstrated along with traces of a volatile aldehyde. A balance sheet of C metabolism is presented; C in the mycelium is about  $\frac{1}{2}$  of that in evolved  $CO_2$ , the proportion decreasing over several weeks' growth. R. M. M. O.

Physiology of *Rhizobium* species. D. G. CLARK (Cornell Univ. Agric. Exp. Sta. Mem., 1936, No. 196, 30 pp.).—The substance responsible for growth acceleration of *R. trifolii* occurs in brown sugar, "Ca saccharate," and peptone, but not in maize starch. It is destroyed by ashing and by wet combustion, is a non-electrolyte, is absorbed by C, and is not pptd. by  $Pb(OAc)_2$ . It is dialysable to about the same extent as the sol. N and ash constituents of carrot extract. It does not resemble a vitamin and is probably not rhizopin, auxin, or inositol, but exhibits certain of the properties of bios. A. G. P.

Nitrogen metabolism of the crown gall and hairy root bacteria. H. A. CONNER, W. H. PETERSON, and A. J. RIKER (J. Agric. Res., 1937, 54, 621—628).—In media containing yeast infusion and glucose  $\frac{1}{2}$  of the total N was changed into cellular protein by these organisms.  $NH_2-N$  in the medium was increased by growth of the crown gall but not by the hairy root bacteria.  $NH_4$  salts were utilised by both. Omission of glucose from the medium largely increased  $NH_3$  production but did not affect protein formation. Crown gall and attenuated crown gall organisms utilised  $NH_4NO_3$  as sole source of N,  $NH_4^+$  being more effective than  $NO_3^-$ . Polypeptide and  $NH_2-N$  were utilised with increased formation of cellular protein and  $NH_3$ . The N fraction pptd. by tungstic acid was less readily utilised. A. G. P.

Bacterial leaf spot of geranium. W. H. BURKHOLDER (Phytopath., 1937, 27, 554—560).—The causal organism (*Phytomonas geranii*, nov. sp.) is described and its ability to utilise a variety of C and N sources is examined. A. G. P.

Presence of micro-organisms in althaea leaves. J. BABIČKA and A. ŘÍDKÝ (Časopis Českoslov. Lek., 1936, 16, 3—11; Chem. Zentr., 1936, i, 3363).—Characteristics of the organisms are described. H. N. R.

Carotenoids of purple bacteria. III. E. SCHNEIDER (Rev. Fac., 1936, 1, No. 2, 74—80; Chem. Zentr., 1936, i, 3525; cf. A., 1934, 1265).—From cultures of S-free purple bacteria two carotenoid fractions are isolated. The spectrum of fraction I resembles that of lycopene. Fraction II is similar to phytoxanthene in solubility and adsorption properties, but its absorption spectrum is unlike that of xanthophyll. Both fractions consist of several very similar (? isomeric) components. The ratio of the pigments is similar to that of the chloroplast pigments of higher plants (chlorophyll : carotenoid = 2.75; I : II = 0.6). Carotenoids are probably concerned in the assimilation process. A. G. P.

Quantum yield of hydrogen and carbon dioxide assimilation in purple bacteria. C. S. FRENCH (J. Gen. Physiol., 1937, 20, 711—735).—The rates of photoassimilation of  $H_2$  and  $CO_2$  by *Streptococcus varians* under various conditions are compared. Irradiation of thin suspensions of the bacteria with  $\lambda\lambda$  852 and 894  $m\mu$  shows that in this region the photo-reaction  $2H_2 + CO_2$  requires 4 quanta. F. A. A.

Gum-producing bacteria.—See B., 1937, 716.

Optical activity of lactic acid produced by *Lactobacillus acidophilus* and *L. bulgaricus*. L. M. KOPELOFF and N. KOPELOFF (J. Bact., 1937, 33, 331—334).—The R form of *L. acidophilus* produced *dl*-acid; that of *L. bulgaricus* produced the *dl*-acid in the first 6 fractions and the *d*-form in the 7th. S forms of both organisms yielded *d*-acid. A. G. P.

Growth factors for bacteria. III. Nutritive requirements of *Lactobacillus delbrückii*. E. E. SNELL, E. L. TATUM, and W. H. PETERSON. IV. Acidic ether-soluble factor essential for growth of propionic acid bacteria. H. G. WOOD, E. L. TATUM, and W. H. PETERSON (J. Bact., 1937, 33, 207—225, 227—242; cf. this vol., 224).—III. Stimulative effects of aq. extracts of potatoes on the growth of lactic bacteria, notably *L. delbrückii*, are recorded. Tryptophan (I) is essential for the growth of this organism. For luxuriant growth in the presence of hydrolysed casein and (I) two unknown factors are necessary. One occurs in the Neuberg filtrate or the acid- $Et_2O$  extract of an aq. potato extract and is possibly an acid of low mol. wt.; the other is basic and occurs in peptone. Both are destroyed by acid hydrolysis. Both are present in liver extracts.

IV. An  $Et_2O$ -sol. factor from yeast extract is indispensable for growth of propionic bacteria on a synthetic  $(NH_4)_2SO_4$  medium. Hydrolysed casein improves growth and permits repeated sub-culturing on the synthetic nutrient. The factor is found in all materials (yeast, maize, potato and liver extracts) which favour growth of the organism. It differs chemically and biologically from hepatoflavin, vitamin- $B_1$ , pantothenic acid, indolylacetic acid, inositol, nicotinamide, and the *sporogenes* vitamin. A. G. P.

Cultivation of cellulose-splitting bacteria on membranes of *Acetobacter xylinum*. M. ASCHNER (J. Bact., 1937, 33, 249—252).—The organisms

may be detected within 48 hr. by liquefaction of media containing *xylinum* cellulose. A. G. P.

**Fermentation with butyric acid bacilli. II.** H. PELDAN (Suomen Kem., 1937, 10, B, 13—14).—No MeCHO can be detected when glucose is fermented by the bacilli in presence of excess of  $\text{Na}_2\text{SO}_3$  (cf. this vol., 224). M. H. M. A.

**Dissimilation of pyruvic acid by *Clostridium butylicum*.** R. W. BROWN, O. L. OSBURN, and C. H. WERKMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 203—205).—Cell suspensions of *Cl. butylicum* convert  $\text{AcCO}_2\text{H}$  into  $\text{AcOH}$ ,  $\text{PrCO}_2\text{H}$ ,  $\text{CO}_2$ , and  $\text{H}_2$ .  $\text{H}_2$  donated by  $\text{AcCO}_2\text{H}$  can reduce  $\text{PrCO}_2\text{H}$  only when the  $p_{\text{H}}$  is  $<6.3$ .  $\text{HCO}_2\text{H}$  is not decarboxylated and lactic acid is not dehydrogenated. W. O. K.

**Reaction with iron compounds for determination of *B. anthracis* and of its pathogenicity.** E. DE ANGELIS (J. Bact., 1937, 33, 197—206).—A colour reaction between  $\text{Fe}^{\text{II}}$  or  $\text{Fe}^{\text{III}}$  salts and a substance produced by *B. anthracis* differentiates this organism from other species, distinguishes between virulent and avirulent types, and indicates the potency of different strains. A. G. P.

**Respiration of *B. coli*.** F. L. WYND (Proc. Soc. Exp. Biol. Med., 1937, 36, 343—345).—The rate of  $\text{O}_2$  uptake of *B. coli* exhibits two cycles of respiratory activity. H. G. R.

**Effect of metabolites on growth and differentiation in the colon group.** M. J. POWERS and M. LEVINE (Proc. Soc. Exp. Biol. Med., 1937, 36, 274—276).—Cultures of *coli-aerogenes* organisms contain substances which show sp. growth-inhibiting effects on homologous strains. P. G. M.

**Methylene-blue reduction test for distinguishing between *coli* and *aerogenes* types of lactose-fermenting organisms in water and faeces.** T. N. S. RAGHAVACHARI and P. V. S. IYER (Indian J. Med. Res., 1935, 23, 463—466).—The test is conclusive for *B. coli*, but not for *B. aerogenes* and the intermediate types of coliform organisms. R. N. C.

**Changes in the fermentation by *B. coli* in presence of *Enterococcus*.** M. MILLET, R. REFFETOFF, and L. FINCLERC (Compt. rend. Soc. Biol., 1937, 125, 391—392).—*B. coli* produces fermentation only when grown in a medium where *Enterococcus* fermentation has commenced. H. G. R.

**Comparison of metabolic activities of *Aerobacter aerogenes*, *Eberthella typhi*, and *Escherichia coli*.** C. E. CLIFTON (J. Bact., 1937, 33, 145—162).—Data for growth rates, oxidation-reduction potential,  $\text{K}_3\text{Fe}(\text{CN})_6$ -reduction, and  $\text{O}_2$ - $\text{CO}_2$  exchange are given. The concns. of peptone, oxidant, and of organisms are closely concerned in controlling metabolic activity. The rate of metabolism per cell is max. during the early phases of growth because of the increased size of the cells and the higher concn. gradient of nutrients between cells and substrate. A. G. P.

**Acid production by the *Escherichia-Aerobacter* group of bacteria as indicated by dissolved metallic iron.** A. V. SYROCKI, J. E. FULLER,

and R. L. FRANCE (J. Bact., 1937, 33, 185—192).—In peptone-glucose media bacteria of this group produce sufficient acid to cause dissolution of Fe filings placed in the medium. Addition of 0.3% of  $\text{K}_2\text{HPO}_4$  to the nutrient prevented dissolution of Fe by *A. aerogenes*, but not that by *E. coli*.

A. G. P.

**Bacterial production of histamine from urea.** M. L. BRUHL, G. UNGAR, and A. LEVILLAIN (Compt. rend., 1937, 204, 1222—1224).—Growth of strains of *B. coli* and *Pneumobacillus* in media containing urea as sole source of N is accompanied by production of traces of histamine. F. O. H.

**Mechanism of bacteriolysis *in vitro*.** A. GRIMBERG, S. MUTERMILCH, E. AGASSE-LAFONT, and H. PELLIER (Compt. rend. Soc. Biol., 1937, 125, 521—523).—Vigorous multiplication of *B. coli* is observed after a few hr. even when the blood is not sufficiently diluted to prevent entirely the lytic action of alexin. The latter is totally destroyed in the first few hr. and there is then no further hindrance to bacterial growth. H. G. R.

**Cell size and metabolic activity at various phases of the bacterial culture cycle.** E. HUNTINGTON and C. E. A. WINSLOW (J. Bact., 1937, 33, 123—144).—The greater metabolic activity of cultures of *E. coli*, *Salmonella gallinarum*, and *S. pullorum* in the lag period than in the logarithmic phase is not adequately explained by the increase in cell vol. Cells appearing at the end of the lag and early in the logarithmic phase are distinct in respect of metabolism, size, and subsequent development. The characteristics of "physiological youth" are an increased metabolic rate followed, in order, by increased cell size and increased rate of division. After peak vals. are reached, size and metabolism decrease rapidly whereas the division rate persists for some time. Stimulation of cell division by glucose is not accompanied by increased production of  $\text{CO}_2$ . A. G. P.

**Nutrition of *Staphylococcus aureus*. Activities of nicotinamide, aneurin (vitamin- $B_3$ ), and related compounds.** B. C. J. G. KNIGHT (Biochem. J., 1937, 31, 966—973).—Aneurin (I) ( $10^{-7}M$ ) + nicotinic acid ( $10^{-5}M$ ) or its amide can completely replace the staphylococcus growth factor, enabling the growth of 12 typical strains of *S. aureus* to take place in a medium of known chemical composition. The pyrimidine + the thiazole corresponding with (I) can also be utilised by the organisms instead of the complete mol. but other closely related substances, e.g., (I) lacking the  $\text{CH}_2\text{CH}_2\text{OH}$  group in the 5 position of the thiazole ring, are inactive. Similarly 4-amino-5-aminomethyl-2-methylpyrimidine 4-methyl-5- $\beta$ -hydroxyethylthiazole permits growth but substitution of 4-OH for the 4- $\text{NH}_2$  in the pyrimidine nucleus causes loss of activity. P. W. C.

**Determination of staphylococcal types by fermentation of mannitol.** L. A. JULIANELLE (Proc. Soc. Exp. Biol. Med., 1937, 36, 117—119).—The immunological types A and B of 102 cultures of staphylococci were differentiated, within 5%, by fermentation of mannitol. P. G. M.

**Lipins of tubercle bacilli. XLVII. Composition of the avian tubercle bacillus wax.** R. E. REEVES and R. J. ANDERSON (J. Amer. Chem. Soc., 1937, 59, 858—861; cf. A., 1936, 1028).—The wax of avian tubercle bacilli, purified by pptn. by MeOH from  $\text{CHCl}_3$  or  $\text{Et}_2\text{O}$ , has m.p. 54—55°,  $[\alpha]_D^{25} +38.6^\circ$  in  $\text{CHCl}_3$ , I val. 4.5, and contains C 75.38, H 12.14%, and P a slight trace, a second fraction with m.p. 53—55°,  $[\alpha]_D^{25} +17.7^\circ$  in  $\text{CHCl}_3$ , and I val. 8.7, being also obtained. When hydrolysed it gives trehalose 11.3—13.3, EtOH-insol. K soaps 80—82, acids giving sol. K salts 2.2—2.6, and neutral material 9.1—10.8%. The neutral material is mainly *d*-eicosan- $\beta$ -ol,  $[\alpha]_D^{25} +6.79^\circ$  in  $\text{Et}_2\text{O}$  (3:5-*d*-nitrobenzoate, m.p. 77.5—78°,  $[\alpha] +23.4^\circ$  in  $\text{CHCl}_3$ ), with some *d*-octadecan- $\beta$ -ol, m.p. 53—54°,  $[\alpha]_D^{25} +4.84^\circ$  in  $\text{CHCl}_3$  (3:5-*d*-nitrobenzoate, m.p. 71—72°,  $[\alpha]_D^{25} +25.3^\circ$  in  $\text{CHCl}_3$ ), both identified by mixed m.p. and oxidation to the ketones. The acids from the insol. K salts were optically active, unknown OH-acids and were separated by ligroin into fractions, (I) about  $\text{C}_{38}\text{H}_{74}\text{O}_3$ , m.p. 69—70°,  $[\alpha]_D^{25} +5.6^\circ$  in  $\text{CHCl}_3$ , I val. 6.5 [active H 0.92; *Ac*, m.p. 54—55°, and *Br*- (22.4%) -derivative, m.p. 47—49°; *Me* ester, m.p. 54—55°], and (II) about  $\text{C}_{88}\text{H}_{174}\text{O}_3$ , m.p. 60—61°,  $[\alpha]_D^{25} +5.5^\circ$  in  $\text{CHCl}_3$ , I val. 5.5 [active H 0.82; *Ac*, m.p. 48—57°, and *Br*- (22.9%) -derivative, m.p. 43—49°; *Me* ester, m.p. 49—50°]. The acids from the sol. salts were also a complex mixture of low I val. The common acids and glycerol were absent.

R. S. C.

**Fatty acids of tubercle bacillus. T. WAGNER-JAUREGG** (Z. physiol. Chem., 1937, 247, 135—140).—The COME<sub>2</sub>-sol. fat, on decolorisation and hydrogenation, yields cerotic acid, m.p. 80°, and, as *Me* esters, tuberculostearic (cf. Spielman, A., 1934, 1141) and phthioic acids. A mixture of *Me* ester fractions, following conversion into the acids, yields a 2:4:6-tribromoanilide, m.p. 66—68°, corresponding with an acid  $\text{C}_{29}\text{H}_{58}\text{O}_2$ .

F. O. H.

**Effect of saponin on the vitality of the tubercle bacillus and on the evolution of experimental tuberculosis in the guinea-pig.** B. ANANIADIS and E. MATTHIAKI (Compt. rend. Soc. Biol., 1937, 125, 415—417).—No effect was observed with 0.25% saponin on the growth of the bacillus and the course of the infection was aggravated.

H. G. R.

**Racemisation of the proteins of *Vibrio cholerae* and related organisms. I. Diamino-acids. II. Monoamino-acids.** B. N. MITRA (Indian J. Med. Res., 1936, 23, 573—578, 579—588).—I. Racemisation of the proteins with dil. alkali does not affect the optical activity of lysine in either protein, but histidine is completely racemised in both. Arginine is partially racemised in protein-I (I), and completely in protein-II (II).

II. Alanine, valine, tyrosine, and aspartic acid are completely racemised in both proteins. Leucine is racemised only in (I), glutamic acid only in (II). Proline is racemised more completely in (II) than in (I), whilst hydroxyproline (III) is not racemised in either protein. Extraction with  $\text{Bu}^\text{O}\text{OH}$  simplifies the isolation of the individual  $\text{NH}_2$ -acids.  $\text{Bu}^\text{O}\text{OH}$  does not appear to extract glycine and (III) completely.

R. N. C.

**Respiration and glycolysis of the cholera and cholera-like vibrios.** R. W. LINTON, B. N. MITRA, and D. N. MULLICK (Indian J. Med. Res., 1936, 23, 589—599).—Metabolism is most active in group I, and least in group III and the medusa-head organisms. Aerobic glycolysis does not take place in the El Tor group. Variation of the strain in chemical structure and classification induces corresponding changes in metabolism. Metabolism in rough strains is < in smooth strains. The source, chemical structure, and metabolism of the vibrios can be correlated.

R. N. C.

**Preparation and properties of a specific polysaccharide from a strain of *Vibrio cholerae*.** D. L. SHRIVASTAVA and S. C. SEAL (Proc. Soc. Exp. Biol. Med., 1937, 36, 157—161).—A polysaccharide, serologically active in concns.  $\leq 1:12,000,000$ , isolated from Inaba variant strain of the vibrio, gives N 2.62, ash 7.8%,  $\alpha +58^\circ$ , and on hydrolysis yields glucose. In various strains of cholera vibrios a relation can be demonstrated between serological interactions and the composition of the sp. polysaccharide.

W. O. K.

**Study of dehydrogenation by washed [resting] bacteria by a modification of the methods of Thunberg and Quastel and of Braun and Worderhoff.** D. BACH (Bull. Soc. Chim. biol., 1937, 19, 87—99).—The method is described and its application exemplified (cf. A., 1926, 434; Zentr. Bakt., 1935, 128, 50).

F. O. H.

**Improved Thunberg technique for bacterial oxidations.** F. H. JOHNSON (Proc. Soc. Exp. Biol. Med., 1937, 36, 387—390).—Deaeration is affected by a stream of  $\text{H}_2$  or  $\text{N}_2$ .  $\alpha$ -Methylglucoside is readily dehydrogenated by *Achromobacter fischeri*.

H. G. R.

**Bacteriophages of the lactic bacteria of milk.** P. MAZE (Compt. rend. Soc. Biol., 1937, 125, 412—415).—The bacteriophage is stable for 5 min. at 80° but is destroyed in 5 min. at 85°.

H. G. R.

**Purified bacteriophage from lysogenic cultures.** C. A. COLWELL (Proc. Soc. Exp. Biol. Med., 1937, 36, 100—103).—Bacteriophage from a non-sucrose-fermenting strain of *B. coli*, when purified as described, is more sensitive to chemical and physical agents than homologous broth phage. It is inactivated in 30 min. at 65° (broth phage 75°), and by 50% COME<sub>2</sub> in 24 hr. (broth phage is only slightly affected).

P. G. M.

**Direct isolation of human influenza virus in tissue culture medium and on egg membrane.** T. FRANCIS, jun. and T. P. MAGILL (Proc. Soc. exp. Biol. Med., 1937, 36, 134—135).—The virus was cultivated directly on chick embryo-Tyrod medium and also on the chorio-allantoic membrane of the developing chick.

W. O. K.

**Chemistry of influenza and other viruses.** M. COPISAROW (Chem. and Ind., 1937, 641).—A discussion.

**Inactivation of vaccinia virus by ascorbic acid and glutathione.** I. J. KLIGLER and H. BERNKOPF (Nature, 1937, 139, 965—966; cf. A., 1936, 1423).—Small amounts of vitamin-C can inactivate

infective doses of vaccinia virus inoculated into a rabbit testicle. Glutathione (I) acts similarly but is less effective. The action probably depends on the oxido-reducing properties of -C and (I). L. S. T.

**F-Type potato virus in Australia.** J. G. BALD (Nature, 1937, 139, 674).—The potato virus recently isolated in Ireland has been found in Australia in potatoes with a slight aucuba mottling of the foliage. The virus causes severe necrosis on pepper, and does not protect potato plants from infection with Y-type viruses. *Solanum nigrum* is an important host. L. S. T.

**Correlation between movement of the curly-top virus and translocation of food in tobacco and sugar beet.** C. W. BENNETT (J. Agric. Res., 1937, 54, 479—502).—Invasion of the plant by the virus is but little related to the rate of multiplication or concn. gradient of the virus but depends on other physiological processes, notably nutrient transport. In beet and tobacco movement of the virus is retarded by conditions causing excessive carbohydrate production and increased by food deficiency. The use of virus as an indicator of food translocation in plants is suggested. A. G. P.

**Relation of Stanley's crystalline tobacco virus protein to intracellular crystalline deposits.** H. P. BEALE (Contr. Boyce Thompson Inst., 1937, 8, 413—431).—The intracellular deposits are examined. Transformation of cryst. plates into needles by mineral acids is shown in several hosts. The plates are probably more complex than, but are the source of, Stanley's cryst. virus. A. G. P.

**Tobacco mosaic virus: inactivation by ultra-violet light.** W. C. PRICE and J. W. GOWEN (Phytopath., 1937, 27, 267—282).—Survival vals. of the virus exposed to ultra-violet light follow a simple exponential curve. The rate of inactivation is greatest in the most highly purified material (solution of cryst. virus). A. G. P.

**Pimelic acid as a growth-accessory for the diphtheria bacillus.** J. H. MUELLER (J. Biol. Chem., 1937, 119, 121—131).—Growth-accelerating action of cow's urine was traced to pimelic acid (I), of which 0.6 g. could be isolated from 100 gals. of urine; the initial content is indicated to be 0.001%. Max. growth effect is obtained in media containing  $0.025 \times 10^{-6}$  g. of (I) per c.c. Azelaic acid was also isolated from the urine but does not promote the bacterial growth. Liver extract has a similar action to that of urine, but less intense, and may thus also contain smaller amounts of (I), which, however, could not be isolated from it. R. M. M. O.

**Role of some growth factors in the production of diphtheria toxin.** A. MUSTAFA (Compt. rend. Soc. Biol., 1937, 125, 615—617).—Addition of yeast extract to the medium accelerates production of the toxin. H. G. R.

**Growth factors for propionic and lactic acid bacteria.** H. G. WOOD, A. A. ANDERSON, and C. H. WERKMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 217—219).—Strains of propionic bacteria which failed to develop satisfactorily on an  $\text{NH}_2$ -acid-free

medium grew better and produced larger quantities of acid if lactoflavin was present. The growth requirements of various lactic bacteria are discussed.

W. O. K.

**Influence of deuterium oxide on growth and morphology of lactobacilli.** H. H. WEISER (Proc. Soc. Exp. Biol. Med., 1937, 36, 151—152).— $\text{D}_2\text{O}$  (>5%) in whey-broth media had no appreciable effect on the growth and morphology of strains of *L. acidophilus* and *L. bulgaricus*. W. O. K.

**Bactericidal and antitoxic action of vitamin-C.** J. VON GAGYI (Klin. Woch., 1936, 15, 190—195; Chem. Zentr., 1936, i, 3358; cf. A., 1935, 1527).—Vitamin-C inhibits the activity of bacteria in the organism and detoxicates and lowers the virulence of pathogenic bacteria, e.g., diphtheria bacillus.

A. G. P.

**Bactericidal action of the intestinal fluid of the silkworm, *Bombyx mori*, L.** Y. NAKAZAWA (Bull. Sericult., 1937, 9, 159—166).—Variations in the bactericidal activity (against *B. prodigiosus*) of the fluid due to nutrition and condition of the silkworm and to changes in temp. and dilution of the fluid are described. An alkaline substance appears to be the active principle.

F. O. H.

**Action of radiations on bacteria. III.  $\gamma$ -Rays on growing and on non-proliferating bacteria.** D. E. LEA, R. B. HAINES, and C. A. COULSON (Proc. Roy. Soc., 1937, B, 123, 1—21; cf. A., 1936, 641).—The lethal action of  $\gamma$ -rays on aq. suspensions of *B. coli* and *B. mesentericus* gives exponential survival curves. The mean lethal ionisation dosages approx. = those obtained for  $\beta$ -rays when rate of death was very much greater. In a nutrient medium lethal action on and growth of *B. coli* are independent. Abnormally long, filamentous forms of *B. coli* are probably due to the inhibiting effect of radiation on division.

E. M. W.

**Photodynamic action of dyes on bacteria.** T. TUNG and S. H. ZIA (Proc. Soc. Exp. Biol. Med., 1937, 36, 326—330).—Eosin, after exposure to light, has 10,000 times its native bactericidal activity (methylene-blue 100 times). Mercurochrome is more bactericidal in the absence of light, whilst trypanflavine is intermediate between the two. The reaction of bacteria to Gram's stain parallels their susceptibility to photodynamic action.

P. G. M.

**Bacteriostatic and bactericidal action of Great Salt Lake water.** C. E. ZOBELL, D. Q. ANDERSON, and W. W. SMITH (J. Bact., 1937, 33, 253—262).—The  $\text{H}_2\text{O}$  kills sewage, soil, and oral organisms, and carries a flora of obligate halophytes requiring a min. salt content of 13%.

A. G. P.

**Carotenoids and other lipid-soluble pigments in the sea and in deep marine mud.**—See A., I, 430.

**Phosphorus compounds in the muscles of adrenalectomised rabbits.** M. F. DE MIRA and A. DA CRUZ (Compt. rend. Soc. Biol., 1937, 125, 552—554).—Muscle-P could not be correlated with symptoms of adrenal insufficiency.

H. G. R.

**Asthenic effect of adrenalectomy and the physico-chemical properties of muscle.** G.

BENETATO and R. OPREAN (Bull. Soc. Chim. biol., 1937, 19, 69—86; cf. A., 1936, 750).—Adrenalectomy in frogs reduces the  $p_H$  and, by diminishing the phosphagen content and modifying the muscle-proteins, the buffering power of the muscles. F. O. H.

**Chlorine and sodium chloride content of muscle and brain tissue after adrenalectomy.** M. CAHANE (Bull. Soc. Chim. biol., 1937, 19, 353—356).—After adrenalectomy in rats, the Cl and NaCl contents of muscle and brain tissue are > those of normal rats. A. L.

**Potassium in adrenal insufficiency.** C. I. URECHIA, G. BENETATO, and RETEZEANU (Compt. rend. Soc. Biol., 1937, 125, 191—192).—After adrenalectomy in frogs, a decrease in K in the tissues, particularly the brain, occurs. H. G. R.

**Reaction of adrenaline on cat and guinea-pig uterus during the different stages of the sexual cycle and the effect of hormones.** P. HOLTZ and K. WOLLPERT (Arch. exp. Path. Pharm., 1937, 185, 20—41).—Adrenaline always increases the action of follicular or corpus luteum hormone when these are acting individually on the uterus but is inhibitory when both hormones are acting simultaneously. P. W. C.

**Effect of barbiturates on the increased secretion of adrenaline after insulin.** J. LA BARRE and G. KETTENMEYER (Compt. rend. Soc. Biol., 1937, 125, 377—378).—The increased secretion of adrenaline is suppressed in the dog. H. G. R.

**Synergism of adrenaline and pituitary hormone. Adrenaline glycogenolysis.** L. KÉPINOV (Compt. rend., 1937, 204, 1218—1220; cf. this vol., 228).—The principle occurring in the liver (frog) synergising adrenaline in its glycogenolytic function is of pituitary origin. F. O. H.

**Physiological properties of extracts of the adrenal cortex.** A. GRADINESCO and N. SANTA (Compt. rend. Soc. Biol., 1937, 125, 197—200).—No effect was observed on the capillaries at the maintenance dosage, but on increasing this a vasoconstricting and hypotensive action developed. The extracts had an intense mydriatic action which cannot be attributed to adrenaline. H. G. R.

**Effect of adrenal cortical hormone on renal excretion of electrolytes in normal subjects.** G. W. THORN (Proc. Soc. Exp. Biol. Med., 1937, 36, 361—364).—Excretion of  $Na^+$ ,  $Cl^-$ , and  $H_2O$  was decreased and that of inorg.  $PO_4'''$  increased. H. G. R.

**Resynthesis of muscular glycogen in the hypophysectomised toad.** R. G. DAMBROSI (Compt. rend. Soc. Biol., 1937, 125, 539—541).—Resynthesis is decreased but returns to normal if the principal lobe is implanted. H. G. R.

**Glycogen and the pituitary.** B. A. HOUSSAY, A. BIASOTTI, and R. G. DAMBROSI (Compt. rend. Soc. Biol., 1937, 125, 542—544).—In hypophysectomised animals glycogenolysis is rapid during fasting, but is decreased by insulin and adrenaline. H. G. R.

**Effects of sugar, glycerol, and urea on hormones of cattle anterior pituitary glands.** S. J. HAYWARD and L. LOEB (Proc. Soc. Exp. Biol. Med.,

1937, 36, 250—253).—The characteristic effect of immersion of the glands in sucrose solutions (>20%) or in glycerol (<50%) is the preservation of the hormones which cause theca and granulosa luteinisation, together with some of the thyrotropic activity. Glands kept in urea solutions (up to 10% and also saturated) at 37°, 40°, and room temp. produce maturation of follicles without other ovarian changes, whilst the thyrotropic activity is usually destroyed. P. G. M.

**Influence of extracts of anterior lobe of pituitary on glucose oxidation and glycogen storage.** H. S. MEYER, L. J. WADE, and C. F. CORI (Proc. Soc. Exp. Biol. Med., 1937, 36, 346—348).—A decrease in carbohydrate oxidation and an increase in liver- and muscle-glycogen was observed after intraperitoneal injection of the extract. H. G. R.

**Action of the pituitary hormone "lipoitrin" on fat and carbohydrate metabolism.** E. KOLLI (Bull. Biol. Méd. exp. U.R.S.S., 1936, 2, 290—291).—The hormone (I) controls fat absorption by the liver, the absorption being accompanied by loss of glycogen. Hence (I) affects carbohydrate metabolism. NUTR. ABS. (m)

**Experimental alteration of galactin content of rat pituitary.** R. P. REECE and C. W. TURNER (Proc. Soc. Exp. Biol. Med., 1937, 36, 283—285).—Ovariectomy decreases the galactin content of the pituitary. Injection of oestrogens into ovariectomised animals increases the content over that of spayed non-treated controls. Daily injection of 500 international units in normal males increases the content per gland and the concn. within the gland. P. G. M.

**Colorimetric determination of sex hormones in human urine.** H. WU and C. Y. CHOU (Chinese J. Physiol., 1937, 11, 413—428).—Female sex hormones are determined as theelin by a colorimetric method based on Kober's reaction with phenol-sulphonic acid (A., 1931, 1195) and male hormones are determined colorimetrically as androsterone using Zimmermann's reaction with  $m-C_6H_4(NO_2)_2$  (A., 1935, 1032). J. L. C.

**Contents of sex hormones in normal and pathological urine.** C. Y. CHOU and H. WU (Chinese J. Physiol., 1937, 11, 429—436).—Vals. for the male and female hormone contents, determined colorimetrically as androsterone and theelin respectively, are reported for the urines of normal male adults, non-pregnant and pregnant females, children of both sexes, and some pathological urines. J. L. C.

**Production of sex hormone in absence of vitamin-E.** B. KUDRJASHEV (Bull. Biol. Med. exp. U.R.S.S., 1936, 1, 345—346).—Addition of large amounts of vitamin-E to the diet of rats which have been long deprived of -E does not cause regeneration of the atrophied seminal vesicles and prostate. Injections of prolan, however, stimulate the hormonal activity of the testis in the -E-deficient rat and restore normal structure of secondary sexual organs. NUTR. ABS. (m)

**Effect of acid-hydrolysis on the yield of androgenic and oestrogenic activities from human**

**urine.** D. H. PETERSON, T. F. GALLAGHER, and F. C. KOCH (J. Biol. Chem., 1937, 119, 185—188).—Androgenic activity (extractable by  $C_6H_6$ ) of urine is approx. doubled by boiling (in air or  $CO_2$ ) with 10% HCl for 15 min. but on longer boiling it decreases, reaching the original val. after several hr. Under the same conditions, oestrogenic activity is completely liberated after 15 min. with no loss on longer boiling. R. M. M. O.

**Extracts containing the gonad-stimulating hormone of pregnant mare's serum.** G. F. CARTLAND and J. W. NELSON (J. Biol. Chem., 1937, 119, 59—67).—Fractional pptn. of the plasma with  $COMe_2$  or EtOH, removal of impurities by adjustment of and re-pptn. with an increased concn. of  $COMe_2$  gives the hormone (I) in 60—90% yield as a dry,  $H_2O$ -sol. powder. Pptn. at the isoelectric point gave small amounts of (I) assaying at 140 rat units per mg. (I) is rapidly destroyed by conc. acids, and by exposure to 4%  $CH_3O$  for 3 hr. at  $p_H$  8. It is stable at 60° at 6, 7, and 8. Incubation with trypsin at  $p_H$  7.5—8.7 for 6 hr. at 40° completely destroys (I), but it is not attacked by invertase or emulsin at  $p_H$  6.5 for 1 hr. at 40°. J. N. A.

**Supposed oestrogenic action of a cholesterol preparation.** P. RONDONI, V. CARMINATI, and A. CORBELLINI (Z. physiol. Chem., 1937, 247, 225—226).—Experiments indicating the absence of oestrogenic activity from cholesterol are described in a further reply to Voss and Rabald (this vol., 101). F. O. H.

**Seasonal variation in serum-calcium. Relationship with ovarian activity in the bitch.** J. CHEYMOL and A. QUINQUAUD (Compt. rend. Soc. Biol., 1937, 125, 320—322).—Max. vals. were observed after periods of "heat," no variation occurring in ovariectomised animals. H. G. R.

**Relationship between rat and mouse units of oestrogenic activity.** L. W. ROWE and A. E. SIMOND (J. Amer. Pharm. Assoc., 1937, 26, 378—380; cf. A., 1936, 644).—Standards for oestrogenic preps. are discussed. One rat unit is equiv. to 5, 0.2, and 1 mouse units for ketohydroxyoestrin (theelin), theelin benzoate, and dihydroxyoestrin benzoate, respectively. F. O. H.

**Androgenic activity of ovarian extracts.** A. S. PARKES (Nature, 1937, 139, 965).—Androgenic activity, due apparently to the presence of substances of the androsterone-testosterone group, has been demonstrated in two crude EtOH- $COMe_2$ - $Et_2O$  extracts of pig ovaries. The origin of the androgenic material in the normal human female is discussed. L. S. T.

**Comparison of the potencies of some androgenic sterols.** D. R. McCULLAGH and B. F. STIMMEL (Proc. Soc. Exp. Biol. Med., 1937, 36, 337—340).—Testosterone propionate or its oxime produces a more prolonged effect than testosterone, androsterone, or  $\Delta^5$ -androstenediol in single injections. The max. effect occurs after 3 days. P. G. M.

**Relationship between the male gonads and the adrenal gland [in mice].** W. CRAMER and E. S. HORNING (Lancet, 1937, 232, 1330—1331). L. S. T.

**Effects of androsterone and testosterone on oestrous cycle of rats.** L. G. BROWMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 205—208).—Daily injections of testosterone (0.5—3.0 mg.) or of androsterone (3.0—5.0 mg.) in sesame oil into normal mature female rats suppress the oestrus cycle as expressed by the vaginal smear. W. O. K.

**Isolation of  $\Delta^{3:5}$ -androsta-17-one from the urine of a man with a malignant tumour of the adrenal cortex.** H. BURROWS, J. W. COOK, E. M. F. ROE, and F. L. WARREN (Biochem. J., 1937, 31, 950—961).—The patient excreted an excessive amount (3000 international units per litre) of oestrogenic hormone, believed to be oestrone, and showed signs of feminism. From 30 litres of urine were isolated (a) 0.75 g. of *p*-cresol (3 : 5-dinitrobenzoate, m.p. 186°; *p*-phenylbenzoate, m.p. 126°); (b) 0.4 g. of a ketone,  $C_{19}H_{28}O$ , m.p. 88—89°,  $[\alpha]_D^{20}$  -30.4° in EtOH, [oxime, m.p. 164—170°; semicarbazone, m.p. 291—292° (rapid heating)], which was shown to contain two ethylenic linkings, giving 17-androstanone on reduction, and to be identical with  $\Delta^{3:5}$ -androsta-17-one (I), prepared by dehydration of dehydroandrosterone (semicarbazone, m.p. 287—288°), the latter on reduction with EtONa giving androstane, m.p. 49°, together with 17-hydroxyandrostane, m.p. 156—158°; (c) a ketone,  $C_{19}H_{28}O_3$  (II), m.p. 269—270°; (d) a ketone, probably  $C_{21}H_{32}O_3$  (III), isolated as the oxime, m.p. 200—202°. (I) had a weak comb-growth-promoting activity in capons but had no oestrogenic or cortical hormone activity. (II) and (III) had no appreciable oestrogenic activity. When the semicarbazone of dehydroandrosterone was heated with NaOEt and the product brominated, oxidised, and debrominated, 3-androstanone, m.p. 97—98° (semicarbazone, m.p. 238—240°), was produced. P. W. C.

**Co-operative activity of testosterone propionate with  $\Delta^5$ -androstenediol and with oestradiol in male rats.** V. KORENCHESKY and M. DENNISON (Biochem. J., 1937, 31, 862—864).—Using castrated rats, co-operative activity between testosterone propionate (I) and androstenediol was seen in the effects on all the sexual organs and on the thymus. Addition of oestradiol to (I) in the doses used caused an increase in the wt. of the seminal vesicles (slight) and of the adrenals (considerable), a decrease in the rate of involution of the thymus (slight), and a gain in body-wt. (considerable). P. W. C.

**Response of anterior pituitary of immature castrated rat to testosterone and related compounds.** J. M. WOLFE and J. B. HAMILTON (Proc. Soc. Exp. Biol. Med., 1937, 36, 307—310).—Injection of testosterone, its acetate or propionate suppressed the increase in size and no. of basophile cells normally occurring after castration. The propionate is the most effective in inducing degeneration of the cells. P. G. M.

**Inhibiting action of testosterone on the plumage of a castrated Sebright cock.** C. CHAMPY (Compt. rend. Soc. Biol., 1937, 125, 329—330).—The anti-masculinising effect of large doses of testosterone acetate (cf. A., 1936, 1031) is very marked

and it is not necessary to assume an abnormal testicular secretion to explain the "Sebright effect."

H. G. R.

**Influence of various hormones on urinary elimination of creatine and creatinine.** F. BURLEBER (Z. ges. exp. Med., 1935, 96, 821—844; Chem. Zentr., 1936, i, 3526).—Increased elimination of creatine (I) and creatinine (II) following castration of adult animals is corr. by administration of testicular hormone, large doses of which cause complete disappearance of creatinuria. Small doses of the female sexual hormone decrease and large doses increase the elimination. Orastin prevents elimination of (I) by intact and by castrated animals. Prolan has no action on the (I) metabolism of castrated or immature animals but causes cessation of creatinuria in intact adults. The thyrotropic hormone (III) of the pituitary increases urinary (I) and (II) in dogs but not in rabbits. Thyroxine increases the (I) content in all animals. Cortin has no action. In dogs with pituitary damage prolant, (III), and thyroxine produce and orastin prevents creatinuria.

A. G. P.

**Increase in blood-cholesterol in man after castration.** G. TELUM (Compt. rend. Soc. Biol., 1937, 125, 577—580).—The increase was observed after 6 months and was independent of the age of the subject.

H. G. R.

**Biological detection of two new hormones using *Rhodeus amarus* as detector.** J. J. DE WIT (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 559—562).—Pregnancy urine contains an active substance, lutidin (I), which when injected into *R. amarus* increases the length of the ovipositor. (I) cannot be extracted by Et<sub>2</sub>O and is thermostable. Follicular liquor from pig ovaries contains oviductin, which behaves similarly, but is sol. in Et<sub>2</sub>O. Aq. extracts of ovaries and corpora lutea from pigs, human placenta, bull and ram testes, and cattle adrenals were all active in the fish test, whilst extracts of thyroid, pancreas, brain, pituitary, pineal body, thymus, liver, and small intestine were inactive. The urine of a man and woman with cancer contained much active substance. During pregnancy, the concn. of (I) in urine remains const. from the second month. During menstruation there is a decrease in (I), which rises again to a max. 19—26 days after. J. N. A.

**Crystalline insulin. IX. Method of crystallisation of insulin.** B. STALLMANN (Arch. exp. Path. Pharm., 1937, 185, 77—80).—Attempts to use Abel's method for crystallisation of German samples of insulin failed and good yields of cryst. material, m.p. 243° (decomp.), were obtained only when the operation was carried out in presence of the acetates of Zn and Fe.

P. W. C.

**Constitution of insulin. II. Reduced insulin preparations.** A. WHITE and K. G. STERN (J. Biol. Chem., 1937, 119, 215—222).—Original (I) and reduced native insulin (II) (this vol., 102) are identical in tyrosine, free NH<sub>2</sub>, and total S content, also in mol. wt. (ultracentrifuge), isoelectric point, viscosity, and ultra-violet absorption. Reoxidation of (II) at  $p_H$  7.55 by air in presence of minute traces of Cu<sup>++</sup> or Fe<sup>++</sup> results in disappearance of -SH groups,

and almost complete loss of physiological activity. Under similar treatment (I) loses 20—38% of its activity.

E. W. W.

**Treatment of diabetes. Clinical and experimental observations with new insulins.** T. I. BENNETT, T. M. DAVIE, D. GAIRDNER, and A. M. GILL (Lancet, 1937, 232, 1319—1323).—The slower action of protamine insulin (Hagedorn), protamine insulin (with Zn) suspension, and Zn-cryst. protamine insulin as compared with ordinary insulin is confirmed. This protracted action is accompanied by the danger of prolonged hypoglycaemia.

L. S. T.

**Organ and tissue metabolism. Carbohydrate metabolism in the hind legs of dogs and the effect on it of insulin.** Y. KANEDA (Mitt. med. Akad. Kyoto, 1936, 18, 1251—1261).—In dogs, administration of insulin (I) results in decrease in the free sugar content of the blood, the effect being more noticeable in the venous than in the arterial blood. The bound blood-sugar diminishes in 1—3 hr. after (I) injection, then increases slowly to the normal val. The differences in the vals. for the bound and free sugar are small. There is no reason to suppose that free blood-sugar is changed into bound by the action of (I).

NUTR. ABS. (m)

**Modification of insulin action by simultaneous administration of glucose.** P. LEVI (Polielinico, 1936, 43, 533—539, 609—614).—In hyperthyroidism the responses to insulin and glucose are exaggerated and that to both combined is a more marked hyperglycaemia with absence of secondary hypoglycaemia.

NUTR. ABS. (m)

**Insulin resorption in the intestines.** F. CHROMETZKA and W. WEDDERER (Z. ges. exp. Med., 1936, 97, 640—644; Chem. Zentr., 1936, i, 3355).—Insulin is resorbed in the small intestine and produces its normal action. Injection into the colon increases blood pressure. The antagonistic effect is ascribed to mol. rearrangement.

A. G. P.

**Quantitative assay of insulin effect.** P. HEINBECKER, M. SOMOGYI, and T. E. WEICHSELBAUM (Proc. Soc. Exp. Biol. Med., 1937, 36, 399—401).—No proportionality was observed between insulin dosage and the area enclosed by the blood-sugar curve.

H. G. R.

**Chemical changes in blood in tetany due to parathyroid deficiency and on administration of parathormone.** S. SIWE (Z. Kinderheilk., 1935, 57, 383—395; Chem. Zentr., 1936, i, 3530).—Parathyroid insufficiency affects blood-Ca quickly and the -P later. The increase in -P does not affect min. -Ca vals. in spite of persistent tetany. The proportion of ultrafilterable Ca never becomes < that corresponding with the ionised Ca at the existing  $p_H$ . Administration of parathormone increases blood-Ca and notably the ultrafilterable Ca in arterial blood, vals. for which may be double those for venous blood. The corresponding P vals. vary (to 50%) in the same manner.

A. G. P.

**Relation between thyroid hormone and vitamin-A.** W. FLEISCHMANN and S. KANN (Wien. klin. Woch., 1936, 49, 1488—1489).—Mice are made more resistant to MeCN by treatment with thyroxine

(I). The action of (I) is counteracted by administration of vitamin-A. The metamorphosis of salamander larvæ induced by administration of (I) is retarded by administration of -A. The acceleration by carotene of the oxidation of unsaturated fatty acid is counteracted by (I). NUTR. ABS. (*m*)

**Antagonism between carotene and the hormone of the thyroid gland.** M. L. ROCHLINA (Bull. Biol. Med. exp. U.R.S.S., 1936, 2, 219—220).—Addition of carotene (I) to H<sub>2</sub>O in which axolotls are developing delays metamorphosis but induces large increases in wt. Dried thyroid hastens metamorphosis but produces no increase in wt. In the presence of (I) and thyroid hormone there is no delay in metamorphosis and some increase in wt., but not as much as in the larvæ receiving (I) only. NUTR. ABS. (*m*)

**Action of Lugol's iodine solution on the thyroxinised heart.** R. K. PAL (Indian J. Med. Res., 1936, 23, 957—962).—Lugol's I abolishes the toxic effect of thyroxine on the frog's heart; the KI of the solution is not responsible for the effect.

R. N. C.

**Molecular formula of thyroglobulin.** G. SANKARAN and M. PATNAIK (Indian J. Med. Res., 1935, 23, 223—227).—Analytical results are given for purified thyroglobulin. The empirical formula is C<sub>415</sub>H<sub>660</sub>O<sub>134</sub>N<sub>114</sub>S<sub>2</sub>K<sub>2</sub>P<sub>3</sub>I.

R. N. C.

**Preparation of a purified thyrotropic hormone by chemical precipitation.** C. G. LAMBIE and V. M. TRIKOUJIS (Biochem. J., 1937, 31, 843—847).—In the method described for the rapid recovery of the thyrotropic hormone of the anterior lobe of ox pituitary glands, most of the protein is removed by salicyl-sulphonic acid, concn. by evaporation is eliminated, the use of org. solvents reduced to a min., and the hormone is finally pptd. with BzOH in EtOH. The product is readily sol. in H<sub>2</sub>O and is active in guinea-pigs in doses of 0.1 mg. The behaviour of the hormone to heat is examined.

P. W. C.

**Effect of thyrotropic hormone and successive administration of thyroxine and thyrotropic hormone on the metabolism of the guinea-pig.** J. MAHAUX (Compt. rend. Soc. Biol., 1937, 125, 379—382).—Previous injection of a large dose of thyroxine inhibits the effect of thyrotropic hormone on the metabolism.

H. G. R.

**Effect of thyroxine on the storage of protein in the liver.** G. SCHONHOLZER (Beitr. path. Anat., 1936, 97, 526—544).—In rats feeding of casein increases deposition of protein (I) in the liver. Treatment with thyroxine causes first the disappearance of glycogen from the liver, and then of (I). If treatment with thyroxine precedes feeding with (I) no deposits are produced.

NUTR. ABS. (*m*)

**Metabolism and importance of iodine in the young organism. III. Vitamins and blood-iodine.** C. FIORI (Riv. Clin. pediat., 1936, 34, 889—932).—In the blood of pigeons on a diet deficient in the antiberiberi vitamin, and of rabbits deprived of the antirachitic vitamin, there is an increase of I content, but in guinea-pigs deprived of vitamin-C there is a slight diminution.

NUTR. ABS. (*m*)

**Relation between vitamins and growth and survival of goldfish in homotypically conditioned water.** G. EVANS (J. Exp. Zool., 1936, 74, 449—476).—Appreciably increased growth results from keeping goldfish in H<sub>2</sub>O "conditioned" by keeping other goldfish in it, but no improvement follows when the synthetic, vitamin-free diet of the fish is supplemented with lemon juice, yeast, and halibut-liver oil. The conditioned H<sub>2</sub>O contains little or no vitamin-B complex or fat-sol. vitamins.

NUTR. ABS. (*m*)

**Accuracy of biological determinations of the vitamins.** K. H. COWARD (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 39—47; cf. A., 1936, 1566).—The importance of variation in response of different animals to the same dose of vitamin is stressed. The variation in the response of animals of different litters is even > the response of individuals. Evidence of fluctuations in the average response of a whole stock of animals over a long period of time shows that it is essential that the standard of reference should always be tested with the vitamin source of unknown potency. Statistical methods for calculating the accuracy of vitamin-D determinations are given.

W. L. D.

**Interpretation of vitamin experiments.** A. JUNG (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 70).—Plotting of experimental data and statistical treatment afford a simple method of estimating probable error and average response to different levels of vitamin feeding.

W. L. D.

**Complementary action of the vitamins. Interrelation of the vitamins and the effect of minerals and endocrine glands.** G. DUBOIS (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 79—88).—In vitamin assays and in general nutrition, the effect of various factors such as the levels of each vitamin fed, the balance of minerals (Fe, Cu, Mn, Br, I), and the proper functioning of hormones is stressed. The importance of various enzymes necessary for the proper action of the vitamins is discussed.

W. L. D.

**Vitamin standardisation.** H. CHICK (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 89—91).—The various standards of -A, -B<sub>1</sub>, -C, and -D in present use are described and the principles of biological standardisation are discussed.

W. L. D.

**Vitamin science.** A. L. BACHARACH (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 92—99).—International standard vitamin preps. are described. The different antirachitic effects of calciferol and -D<sub>3</sub> are discussed and the isolation and synthesis of other vitamins or concentrates are described. The chemical tests for the various vitamins are given.

W. L. D.

**Metabolism of carotene.** H. E. C. WILSON, B. AHMAD, and B. N. MAJUMDAR (Indian J. Med. Res., 1936, 24, 399—409).—In rats depleted of vitamin-A, absorption is most efficient when the carotene (I) is given as green vegetable. (I) is better absorbed from oil than from aq. suspension, but addition to the diet of 5% of ox bile or 10% of meat appears to improve absorption from aq. suspension. Addition

of 10% of fat to the diet makes little difference. When an aq. suspension of (I) is injected intraperitoneally into depleted rats there is considerable absorption by the peritoneal tissues, but eventually -A appears to be produced in the liver. Injection of (I) suspended in isotonic glucose solution into the ear veins of depleted rabbits leads to immediate faecal excretion of yellow pigment. (I) is absorbed unchanged by the liver, and to a smaller extent by the spleen and lungs, from which it slowly disappears. Single injections of up to 2.5 mg. of (I) do not cause the appearance of -A in the liver, but positive results are obtained after 6 injections, amounting to 3.7 mg., given over a period of 3 weeks. NUTR. ABS. (m)

**Chromatographic determination of provitamin-A.** L. ZECHMEISTER (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 20—21).—Many forms of the provitamin exist and their separation from vegetable and animal tissue is described. The Tswett chromatographic determination is given. W. L. D.

**Rôle of vitamin-A in synthesis of the male sex hormone.** B. KUDRJASHEV (Bull. Biol. Med. exp. U.R.S.S., 1936, 1, 406—407).—The injection of prolan into vitamin-A-deficient male rats restores the function of the seminal vesicles and prostrate even while the vitamin deficiency persists. NUTR. ABS. (m)

**Lucerne leaf meal as a source of vitamin-A for growing chickens.** B. W. HEYWANG and H. W. TITUS (J. Agric. Res., 1937, 54, 559—569).—Variation in vitamin-A potency of lucerne meals is as great within a particular type as between different types. To ensure a suitable supply of -A for chickens <5% of meals of unknown potency should be included in the ration. Large animals probably require a higher % of dietary -A than do small animals. A. G. P.

**Carotene and vitamin-A requirements of children.** W. R. AYKROYD and B. G. KRISHNAN (Indian J. Med. Res., 1936, 23, 741—745).—Children on camp diets containing up to  $454 \times 10^{-6}$  g. of carotene at ages <5 years,  $709 \times 10^{-6}$  at 5—8 years, and  $785 \times 10^{-6}$  g. at >8 years showed symptoms of vitamin-A deficiency. R. N. C.

**Vitamin-A of fish-liver oils. I. Abnormal Carr-Price reaction.**—See B., 1937, 697.

**Crystalline esters of vitamin-A.** S. HAMANO (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, 32, 44—49).—The ester  $C_{35}H_{36}O_4$  (I) (not  $C_{35}H_{36}O_2$ ; cf. A., 1935, 1545) from the liver oil of *Theragra chalcogramma* and anthraquinone-2-carboxyl chloride is shown to be an ester of vitamin-A by conversion into the  $\beta$ -naphthoate. (I), which is also obtained from the liver oils of *Stereolepis ischinagi*, *Sebastodes flammeus*, and *Thynnus alalunga*, also affords a cryst. isomeride, m.p. 118°. Vitamin-A palmitate is shown to be a constituent of *T. chalcogramma* and *Sebastodes matsubarae* by isolation of its bis-maleic anhydride adduct (cf. A., 1935, 543) for which a formula is proposed. F. R. G.

**Hydrogenation of the vitamin-A fraction of the liver oil of *Stereolepis ischinagi* (Hilgendorf).**

II. Z. NAKAMIYA (Bull. Inst. Phys. Chem. Res. Japan, 1937, 16, 343—353).—The vitamin-A fraction with  $H_2$ -Pt oxide in AcOH yields an oil, of which the fraction, b.p. 136—138°/vac., when brominated and treated with  $CHNa(CO_2Et)_2$  affords a dicarboxylic acid [converted by heat into a monocarboxylic acid and then a ketone (semicarbazone, m.p. 35°, different from Karrer's semicarbazone, m.p. 69°)], a hydrocarbon,  $C_{18}H_{36}$ , b.p. 108° [also formed when the above bromide is reduced (Zn-AcOH)], and an alcohol,  $C_{18}H_{36}O$ , b.p. 140°. J. L. D.

**Studies in the synthesis of vitamin-A. III.**—See A., II, 342.

**Biological assay of vitamin-A in the diet of Indians.** E. SURIE (Indian J. Med. Res., 1936, 23, 763—775). R. N. C.

**Iodometric determination of vitamin-A.** V. SOLJANIKOVA-NIKOLSKAJA (Bull. Biol. Med. exp. U.R.S.S., 1936, 1, 410—411).—Conc. colloidal aq. solution of vitamin-A is titrated with 0.01N-I and the -A content is calc. on the assumption that 8 I are equiv. to 1 mol. of -A. Optimal results are obtained when I and -A are in contact for 20—40 min. The results agree fairly well with those of the colorimetric method. NUTR. ABS. (m)

**Determination of vitamin-A.** I. K. MURRI (Lenin Acad. Agric. Sci., Inst. Plant Indust. Bull. Appl. Botany Ser. 3, No. 8, 1935, 27—44).—A modification of the method of Deleano and Dick for determining carotene (I) in plant materials is described. Results of chemical and biological determinations of the (I) content of fruits, vegetables, and berries agree well. NUTR. ABS. (m)

**Determination of vitamin-A.** A. CHEVALLIER (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 36—38).—Concns. of vitamin-A solutions are calc. from the absorption in the region  $\lambda$  3250—3280 with inspection of the general absorption in  $\lambda$  2900—3600. A rapid method so that -A is not destroyed by ultra-violet light is advisable. Biological and  $SbCl_3$  methods are discussed. W. L. D.

**Spectroscopic determination of vitamin-A.** R. A. MORTON (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 58—67).—Vitamin-A and its precursors are discussed. Methods of determination depending on the intensity of absorption at  $\lambda$  2800—3600 (max. 3280), and absorption of blue colour with the  $SbCl_3$  reagent at  $\lambda$  6050 and  $\lambda$  5720, are described. The differences in results for oils and their unsaponifiable fractions are discussed and experiences with -A standards and types of cod-liver oil are reported. W. L. D.

**Vitamin-A activity and ultra-violet light: spectrophotometric method of assaying vitamin-A and carotene.** N. K. DE (Indian J. Med. Res., 1935, 23, 505—514).—Irradiation of cod-liver oil causes the band at 328 m $\mu$  to disappear slowly, whilst in solutions of carotene (I) the band at 463 m $\mu$  disappears. Vitamin-A is destroyed more rapidly than (I), and its sp. band is not produced by irradiation of (I), showing that ultra-violet light does not transform (I) into -A. (I) and -A are determined

spectrophotometrically by measurement of the changes produced by irradiation in the absorption coeffs. at 463 and 328 m $\mu$  respectively. R. N. C.

**Effect of vitamins-A and -D on the plasma content of circulating blood.** R. TISLOWITZ and J. KUROWSKI (Biochem. Z., 1937, 291, 73—75).—In dogs oral administration of small or moderate doses of vitamin-A causes diminution of the plasma content of the blood, but if the administration is prolonged or if large doses are given the content is increased. Administration of vitamin-D increases the content. The erythrocyte content of the blood is diminished by giving -A and -D. W. McC.

**Contribution of vitamin-B<sub>1</sub> to the metabolism of brain.** R. A. PETERS (Chem. Weekblad, 1937, 34, 442—448).—A lecture.

**Fermentation test for vitamin-B<sub>1</sub>.** A. SCHULTZ, L. ATKIN, and C. N. FREY (J. Amer. Chem. Soc., 1937, 59, 948—949).—10<sup>-6</sup> g. of natural or synthetic vitamin-B<sub>1</sub> can be detected by its acceleration of the buffered fermentation of glucose by Fleischmann yeast. The action can be used to determine the vitamin and gives results agreeing with those of rat growth tests. R. S. C.

**Vegetative culture test for vitamin-B<sub>1</sub>. Methods, criticism, and results.** W. H. SCHOPFER and A. JUNG (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 22—34).—The growth of *Phycomyces* is sensitive to -B<sub>1</sub> (1 unit of growth = 5  $\times$  10<sup>-9</sup> g. of -B<sub>1</sub>) and the application of this principle for assay of the vitamin is described. Comparative experiments with the rat show good agreement for cryst. vitamin preps., yeast extracts, wheat germ, malt extracts, and rice polishings. Other conditions connected with the composition of the medium are discussed. W. L. D.

**Rat experiments on determination of vitamin-B<sub>1</sub>. Stability of international -B<sub>1</sub> standards.** A. SCHEUNERT and M. SCHIEBLICH (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 13—19).—The determination is based on the survival of  $\leq$  8 rats for 35 days and losing  $\geq$  2 g. in wt. The stability of the international standard is proved by the fact that 6 and 7 mg. were required during 1934 and 1935 respectively. W. L. D.

**Determination of vitamin-B<sub>1</sub>.** R. A. PETERS (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 35).—The val. of the curative pigeon test, the catatorulin test, the CH<sub>2</sub>O-azo-reaction, and Schopfer's *Phycomyces* test is discussed. W. L. D.

**Determination of vitamin-B<sub>1</sub> by the bradycardia method.** L. J. HARRIS (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 100—111).—The increase in rate of heart-beat of B<sub>1</sub>-avitaminised rats  $\propto$  -B<sub>1</sub> content of the supplement. The method has the advantage of rapidity, convenience, and ease of determination of small amounts and avoids complications due to refection. The error of experiment is  $\leq$  9%. Uses of the method are enumerated and the -B<sub>1</sub> contents of various agricultural products are given. W. L. D.

**Constitution of oryzanin.**—See A., II, 354.

**Synthesis of vitamin-B<sub>1</sub>.**—See A., II, 354.

**Heart rate in vitamin-B<sub>1</sub> and -C deficiency.** G. SANKARAN and B. G. KRISHNAN (Indian J. Med. Res., 1936, 23, 747—754).—Vitamin-B<sub>1</sub> deficiency causes bradycardia in pigeons and a fall in the heart rate of rats, which is abolished by administration of -B<sub>1</sub>. -C deficiency causes tachycardia in guinea-pigs. R. N. C.

**Effect of vitamin-B<sub>1</sub> and -C on the persistence of Congo-red in the blood stream.** R. TISLOWITZ (Biochem. Z., 1937, 291, 70—72).—The rate of disappearance from the blood stream of the dog of injected Congo-red is decreased by administration of vitamin-B<sub>1</sub> and -C possibly because these diminish the permeability of the walls of the vessels. W. McC.

**Changes in the content of vitamin-B<sub>1</sub> and -C in germinating cereal grains.** A. VON KUTHY (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 119—126).—By chemical tests it was found that -C increased, but -B<sub>1</sub> decreased, during germination. Germination at 15° produces more vitamin but the vitamin loss at 10° was small. Drying of germinated material decreased the -C but increased the -B<sub>1</sub> content. The effect of this on animal feeding is discussed. W. L. D.

**Biological assays for flavin and dermatitis factors.** C. A. COOK, M. F. CLARKE, and A. E. LIGHT (Science, 1937, 85, 503—504).—Methods for the assay of flavin and other factors in the vitamin-B<sub>2</sub> complex using rats are described. L. S. T.

**Chemical determination of flavin in urine, liver, and milk.** A. EMMERIE (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 57).—The determination of the yellow colour after removal of other pigments is the most reliable method. PbS is used as adsorbent from urine, and after elution and oxidation in AcOH with KMnO<sub>4</sub> and H<sub>2</sub>O<sub>2</sub>, the yellow colour is measured in a step photometer. With liver, oxidation is sufficient and adsorption is unnecessary. With milk, the MeOH-AcOH serum is conc., oxidised with KMnO<sub>4</sub>-H<sub>2</sub>O<sub>2</sub>, and the colour measured. All manipulations are carried out in diffuse daylight or red light. W. L. D.

**Cane molasses versus beet molasses as a source of vitamin-B<sub>6</sub> and lactoflavin.** P. GYORGY (Proc. Soc. Exp. Biol. Med., 1937, 36, 167—169).—Crude cane but not beet molasses is a good source of vitamin-B<sub>6</sub> and contains small amounts of lactoflavin. W. O. K.

**Vitamin-C and antithyroidic action.** A. SCHAFER (Klin. Woch., 1936, 15, 406—407; Chem. Zentr., 1936, i, 3534).—Vitamin-C exerts no antithyroidic action and has no influence on the functional condition of the thyroid. A. G. P.

**Production in vitro of vitamin-C by surviving tissue.** F. WIDENBAUER and K. KOSCHORREK (Biochem. Z., 1937, 291, 209—215).—Slices of surviving small intestine (but not of other parts) of rats and mice (but not of guinea-pigs) in presence of PhMe produce vitamin-C from added glucose. W. McC.

**Effect of vitamin-C on the composition of blood.** Z. ASZÓDI (Biochem. Z., 1937, 291, 34—50).—The erythrocyte content of the blood of guinea-pigs is independent of age but the hæmoglobin and leucocyte contents are lower in the young than in the old. Administration of excess of vitamin-C increases the erythrocyte and decreases the leucocyte content. Scurvy and administration of thyroxine cause first an increase, then a decrease in the erythrocyte content and scurvy, when severe, increases in the leucocyte content. Scurvy is probably a form of hyperthyroidism. W. McC.

**Experimental vitamin deficiency and agents which raise basal metabolism. I.** Gaseous metabolism of animals after various periods on scorbutic diet, at body and low temperatures. **II.** Inhibition of the rise in basal metabolism caused by 2:4-dinitrophenol in animals in an advanced state of scurvy. C. ARDY and L. BELLINI (Riv. Patol. sper., 1936, 6, 139—149, 151—155).—I. The  $O_2$  consumption of guinea-pigs receiving Bezssonoff's scorbutic diet first increases and then decreases at 29°. At approx. 15° the intermediate rise is not observed.

**II.** Dinitrophenol injected into guinea-pigs, which have received a scorbutic diet for approx. 3 weeks, causes no increase in  $O_2$  consumption at 28—30°.

NUTR. ABS. (m)

**Relations between l-ascorbic acid and intermediary gas metabolism.** W. KLODT (Z. ges. exp. Med., 1936, 99, 738—744).—The concn. of reduced ascorbic acid (I) in the venous blood is  $>$  in the arterial blood in normal rabbits and in rabbits which have received intravenous injections of (I). After muscular exercise, the reduction of oxidised (I) is increased. Inspiration of pure  $O_2$  does not affect the equilibrium between the two forms, but during suffocation the balance is rapidly upset in favour of reduced (I). Hence (I) acts as an intermediary in the gas metabolism of cells. NUTR. ABS. (m)

**Variations in glutathione and ascorbic acid in [guinea-pig's] liver.** M. LOEPER, J. COTTET, and G. ESCALLIER (Compt. rend. Soc. Biol., 1937, 125, 502—504).—On a scorbutic diet, parallel variations were observed between glutathione (I) and ascorbic acid (II). (I) but not (II) is increased by injection of cysteine. H. G. R.

**Importance of ascorbic acid for the metabolism of the lens.** A. BAKKER (von Graefe's Arch. Ophthalmol., 1936, 136, 166—171).—Ascorbic acid (I) diffuses into or out of the lens with equal ease. The lens cannot synthesise (I). The transparency of the lens is not dependent on its (I) content, and a normal rate of respiration is possible in a lens deficient in (I). NUTR. ABS. (m)

**Histochemistry. X. Distribution of vitamin-C in the lens.** D. GLICK and G. R. BISKIND (Arch. Ophthalmol., 1936, 16, 990—995).—In the lens of the cow's eye there is very little variation in vitamin-C content from the periphery to the edge of the nucleus, but a slightly lower content in the nucleus. NUTR. ABS. (m)

**Vitamin-C and blood. I. Action of blood on ascorbic acid.** A. FRANCAVIGLIA and F. DE RITTS (Riv. Patol. sper., 1936, 6, 157—173).—In blood, destruction of ascorbic acid (I) is associated with the breakdown of the corpuscles and is not due to the oxidising action of oxyhæmoglobin. (I) is not present in the reversibly oxidised form. NUTR. ABS. (m)

**Effect of ascorbic acid on the oxygen dissociation of the blood and on biological oxidation.** W. KLODT (Klin. Woch., 1936, 15, 1637—1639).—The amounts of oxidised ascorbic acid (I) and dehydroascorbic acid in blood depend on its  $O_2$  content. (I) appears to act as an intermediary in biological oxidation and dehydrogenation. NUTR. ABS. (m)

**Vitamin-C in urine and blood.** E. GABBE (Klin. Woch., 1936, 15, 292—296; Chem. Zentr., 1936, i, 3358; cf. A., 1935, 547).—Determinations by the Martini and Bonsignore method (A., 1934, 1271) show urine to contain the oxidised, reduced, and normal forms of -C. Ascorbic acid (I) is oxidised *in vitro*. The oxidising agent is present in blood corpuscles, especially after hæmolysis, but not in plasma. Elimination of large amounts of -C following repeated daily administration of 300 mg. of (I) is accompanied by marked diminution of the oxidising capacity of blood and urine. A. G. P.

**Effect of avitaminosis-C on the carbohydrate metabolism of guinea-pig muscle.** R. DUFFAU (Compt. rend. Soc. Biol., 1937, 125, 436—439).—An increase in lactic acid and a disturbance in the P metabolism of muscle were observed in scurvy.

H. G. R.

**Presence of vitamin-C in certain substances in plants.** H. N. BANERJEE (Trans. Bose Res. Inst. Calcutta, 1934—1935, 10, 145—170).—The ascorbic acid (I) concn. in the juices of date, palmyra, and coconut palms, and of palm-juice preps. is determined by the 2:6-dichlorophenol-indophenol method. (I) in these juices is extremely stable and the presence of a thermo-labile protective agent in coconut  $H_2O$  is established. The antiscorbutic activity of the coconut fruit is determined in guinea-pigs. A mannose dehydrogenase occurs in the juices. The transference of (I) from  $H_2O$  to kernel to embryo via the follicle is investigated. Green coconut fibre destroys (I). The stability of (I) in coconut  $H_2O$  is contrasted with its instability in the juice of *Citrus decumana*. P. W. C.

**Vitamin-C in vegetables. VII. Lima beans.** D. K. TRESSLER, G. L. MACK, R. R. JENKINS, and C. G. KING (Food Res., 1937, 2, 175—181).—The -C content of 8 varieties of lima bean varies with size of bean and habit of the plant. -C is lost during storage, to a greater extent in the shelled beans and to a smaller extent when refrigerated. The 33% loss which occurs as a result of blanching is materially reduced by shortening the blanching time by one half. E. C. S.

**Antiscorbutic activity of the cabbage.** M. PODZIMKOVA-RIEGLLOVA (Trav. Inst. Hyg. pub. Tchecoslov., 1936, 7, 106—114).—The min. daily doses required to protect guinea-pigs from scurvy were: fresh cabbage 5 g., pickled cabbage 20 g., cooked pickled cabbage 40 g. NUTR. ABS. (m)

**Content of vitamin-C in different varieties of potatoes (Holland).** J. B. H. IJDO (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 127—131).—Different varieties show 60% and tubers of one variety 10% variation in -C content. Place of origin causes a difference, one variety showing 40%. Small and large tubers have the same content and the vitamin is distributed uniformly throughout the body of the tuber. All the -C is in the form of reduced ascorbic acid. W. L. D.

**Antiscorbutic activity of dried fruits of the dog rose.** N. SCHEPILEVSKAJA (Problems of Nutrition, Moscow, 1936, 5, No. 5, 9—12).—< 0.05 g. daily of the dried fruits protects guinea-pigs from scurvy.

NUTR. ABS. (m)

**Antiscorbutic activity of dried rose hips. Antiscorbutic properties of pine needles.**

**VIII. Determination of vitamin-C in pine needle concentrates.** N. SCHEPILEVSKAJA (Problems of Nutrition, Moscow, 1936, 5, No. 6, 73—80, 81—84).—The min. curative and prophylactic dose of dried rose hips is approx. 25—50 mg. daily.

**VIII. The curative dose of pine needle concentrate for guinea-pigs is < the prophylactic dose.**

NUTR. ABS. (m)

**Determination of vitamin-C by titration.** L. J. HARRIS (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 112—118).—Titration with 2 : 6-dichlorophenol-indophenol in acid solution after extraction with  $\text{CCl}_3\text{-CO}_2\text{H}$  gives reliable results. Manufactured products containing heated sugars (reductones) give too high vals. Compounds containing SH groups do not interfere in practice. Various uses of the test are described. The addition of  $\text{HPO}_3$  protects against oxidation. W. L. D.

**Determination of vitamin-C.** V. N. BUKIN (Lenin Acad. Agric. Sci., Inst. Plant Ind. Bull. Appl. Botany, Ser. 3, No. 8, 1935, 5—26).—A modification of the method of Emmerie and van Eekelen (cf. A., 1936, 1159) is suggested, omitting  $\text{CCl}_3\text{-CO}_2\text{H}$  and using a mixture of 2% HCl and 5% aq.  $\text{HgCl}_2$ , in making extracts of plant materials. Materials containing reducing substances other than *l*-ascorbic acid, when treated in this way, give results in harmony with biological vals.

NUTR. ABS. (m)

**Determination of ascorbic acid in serum by the methylene-blue reaction.** E. TRIER (Ugeskr. Læger, 1936, 98, 1238—1241).—Determinations by the method of Lund and Lieck using sera from persons on a diet probably relatively rich in vitamin-C gave vals. of 0.15—1.4 mg. per 100 ml. (average 0.4 mg.); 60% of the vals. lay between 0.3 and 0.45 mg. Administration of 1 mg. of -C per kg. of body-wt. increased the vals., the increases being greatest where the fasting vals. were highest. There was a general correlation between fasting val. and habitual -C intake.

NUTR. ABS. (m)

**Determination of total ascorbic acid with methylene-blue.** C. MENTZER (Compt. rend. Soc. Biol., 1937, 125, 330—333).—Total ascorbic acid is determined with methylene-blue after reduction of dehydroascorbic acid by  $\text{H}_2\text{S}$  at  $p_{\text{H}}$  6.5.

H. G. R.

**Reduced ascorbic acid. Determination by the methylene-blue method.** C. MENTZER and A. VIALARD-GOUDOU (Bull. Soc. Chim. biol., 1937, 19, 707—719).—The reducing val. of tissue can be determined in  $\text{CCl}_3\text{-CO}_2\text{H}$  extracts in terms of reduction of methylene-blue or exposure to an intense source of light (300-watt lamp) in presence of  $\text{Na}_2\text{S}_2\text{O}_4$ , at  $p_{\text{H}}$  approx. 5.8 and  $>20^\circ$ . The method is more sp. than the 2 : 6-dichlorophenol-indophenol method, cystine and glutathione having no effect under the conditions used. P. W. C.

**Biological activity of isovitamin-C.** L. DE CARO and E. ROVIDA (Quad. Nutrizione, 1936, 3, 465—467).—The effects on the adrenals of scorbutic guinea-pigs of daily injections of 50 mg. of vitamin-C or of isovitamin-C (I) fail to show with certainty whether the antiscorbutic activity of (I) is due to (I) or to -C derived from (I). NUTR. ABS. (m)

**Influence of feeding vitamin-D on frog's larvae.** J. ŠTEFL (Arch. exp. Path. Pharm., 1937, 185, 81—84).—Characteristic areas of calcification appeared on the cartilagenous tail fin on feeding large doses of vitamin-D to larvae of *Rana fusca* but no toxic symptoms appeared. P. W. C.

**Calcium and vitamin therapy.** G. PFEIFFER (Z. Kinderheilk., 1936, 58, 515—522).—Ca is better absorbed and assimilated as citrate or glycerophosphate than as  $\text{Ca}_3(\text{PO}_4)_2$  or  $\text{CaCO}_3$ . Administration in combination with vitamin-D increases absorption and storage of Ca, animals being more lively, with better coats, growth, and bone formation, than when fed on Ca alone. NUTR. ABS. (m)

**Properties of calciferol.** F. W. ANDERSON, A. L. BACHARACH, and E. L. SMITH (Analyst, 1937, 62, 430—440; cf. A., 1933, 542).—73 samples of calciferol (I), manufactured under carefully controlled and highly standardised conditions, had m.p.  $116^\circ$  ( $\pm 1^\circ$ ),  $[\alpha]_{\text{D}}^{25} +123.25$ — $125.75^\circ$  in EtOH (4% wt./vol.),  $E_{1\%}^{1\text{cm.}}$  265 m $\mu$  460—500; these vals. are proposed as a revised specification for pure (I), that of the B.P. Addendum 1936 being considered unnecessarily wide. The biological activity of 11 blends varied from 35.7 to 45.0 (weighted mean 40.8) international units per  $10^{-6}$  g. E. C. S.

**Determination of vitamin-D using chickens and the relation of rat- to chicken-activity for different irradiated provitamins.** J. VAN NIERKERK, A. G. BOER, E. H. REERINK, and A. VAN WIJK (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 68—69).—Radiographic and bone ash determinations after 4 weeks' feeding at different vitamin levels to chickens with simultaneous control with standard cod-liver oil were used. Sterol preps. from various sources showed a rat/chicken relation similar to that given by cod-liver oil and the method of assay has been used to follow the separation and concn. of *D*-provitamins from plant and other sources. W. L. D.

**Crystalline vitamin-D<sub>4</sub>.** A. WINDAUS and G. TRAUTMANN (Z. physiol. Chem., 1937, 247, 185—188).—22 : 23-Dihydroergosterol (I) is irradiated, unchanged (I) separated as digitonide, and the adduct of 22 : 23-dihydrotachysterol with citraconic anhydride

formed. Following saponification with MeOH-KOH, extraction with light petroleum-Et<sub>2</sub>O affords an oil which with C<sub>5</sub>H<sub>5</sub>N and 3:5-C<sub>6</sub>H<sub>3</sub>(NO<sub>2</sub>)<sub>2</sub>-COCl yields the 3:5-dinitrobenzoate, m.p. 135–136° (uncorr.),  $[\alpha]_D^{25} +94.5^\circ$  in CMe<sub>2</sub>, hydrolysed to vitamin-D<sub>4</sub>, m.p. 107–108°,  $[\alpha]_D^{25} +89.3^\circ$  in CMe<sub>2</sub>, with absorption spectrum max. (as with -D<sub>2</sub>) at 265 mμ. F. O. H.

**Concentration and properties of vitamin-H.** L. E. BOOHER (J. Biol. Chem., 1937, 119, 223–231).—Vitamin-H is defined as the residuum of the -B-complex, other than -B<sub>1</sub> and flavin, essential for growth in rats. Details are given of its 30-fold concn. from whey powder and a 60–90-fold concn. from rice polishings, with complete separation from -B<sub>1</sub> and flavin. R. M. M. O.

**Vitamin-P.** S. S. ZILVA (Biochem. J., 1937, 31, 915–919).—Administration of a daily dose of the flavonol glucoside "citrin" (I) or of 0.66 mg. of hesperidin (II) + 0.33 mg. of eriodictyol or of 1 mg. of purified (II) did not delay the onset of scurvy in guinea pigs. The administration of a daily dose of 0.1–0.2 mg. of ascorbic acid (doses < the min. prophylactic dose) produced a pathological condition resembling that obtained by Szent-Gyorgyi (A., 1936, 1162) by administration of a daily dose of 1 mg. of (I) or (II) to animals on a scorbutic diet. P. W. C.

**Significance of macromolecular chemistry in biology.** H. STAUDINGER (Chem.-Ztg., 1937, 61, 549).—The special properties of chromosomes may be due to their macromol. character. E. A. H. R.

**Physiology of protoplasmic streaming in leaves of *Vallisneria spiralis*.** H. FITTING (Ber. deut. bot. Ges., 1937, 55, 255–261).—The influence of Na indolylacetate on protoplasmic streaming was > that of tryptophan but < that of histidine (I) and methyl-histidine (II). The presence in leaf extracts of (I) and/or (II) with smaller proportions of less active NH<sub>2</sub>-acids is indicated. A. G. P.

**Changes of apparent ionic mobilities in protoplasm. II. Action of guaiacol as affected by  $p_H$ .** W. J. V. OSTERHOUT (J. Gen. Physiol., 1937, 20, 685–693).—The p.d. across the protoplasm of *Valonia macrophysa* in sea-H<sub>2</sub>O is -10 mv. Addition of 0.01M-guaiacol (I) causes this p.d. to become temporarily positive, and then to return to normal. Increase of  $p_H$ , and hence of (I) ions, causes only minor variations in this behaviour. Increase of  $p_H$  after regaining the normal val., however, causes much greater changes. This behaviour is contrasted with that of other anions, and possible explanations are advanced. F. A. A.

**Adsorption of dyes on cell-walls and the influence of inorganic salts.** F. KERSTING (Ber. deut. bot. Ges., 1937, 55, 329–337).—Cells of *Spirogyra*, *Elodea*, or *Trianea*, stained with methylene- or toluidine-blue or neutral-red, decolorise only in the cell wall on treatment with 0.1M-CaCl<sub>2</sub>, and other salts at  $p_H$  4.6–4.8; the dye remains in the cellular fluid. The rate of decolorisation increases with increasing valency and lyotropy of the cation of the salt. The phenomenon occurs with both dead and living cells. F. O. H.

**Polarity of buffering power in the tissues of *Potamogeton densus*.** L. L. BLUM (Compt. rend. Soc. Biol., 1937, 125, 322–324).—The  $p_H$  of the tissues is  $6.00 \pm 0.12$ . The buffering power of the apical is > that of the distal portion. H. G. R.

**Toxicity and antagonism of some anions in cultures of *Saprolegnia*.** F. MOREAU and (MME.) F. MOREAU (Compt. rend., 1937, 204, 1356–1358; cf. this vol., 71).—Very small amounts of KCl, K<sub>2</sub>SO<sub>4</sub>, and KNO<sub>3</sub> accelerate the growth of *Achlya colorata*, Pringsh. Higher concns. retard or inhibit growth and the development of reproductive organs; NO<sub>3</sub>' is least and SO<sub>4</sub>' most toxic. Cl', SO<sub>4</sub>'', and NO<sub>3</sub>' antagonise one another. J. L. D.

**Kinetics of penetration. XIV. Penetration of iodide into *Valonia*.** A. G. JACQUES (J. Gen. Physiol., 1937, 20, 737–766).—When NaI is added to sea-H<sub>2</sub>O surrounding *Valonia*, I enters the cell. The amount entering as HI is negligible compared with that entering as NaI; HI thus differs markedly from H<sub>2</sub>S (A., 1936, 531). The rate of passage of NaI through the protoplasmic layer is about 10<sup>-6</sup> of that through H<sub>2</sub>O. F. A. A.

**Iron in the nutrition of higher plants.** T. T. DEMIDENKO (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 267–271).—Accumulation of Fe by oats and sunflower occurs mainly before flowering. Fe cannot be replaced by Zn, Mn, Al, Ni, Cd, or Zr. Mg pyrrole-2-carboxylate (cf. Oddo and Polacci, A., 1920, i, 407) applied to the roots, stems, or leaves cannot replace Fe. Colloidal Fe is not absorbed by roots or leaves. W. O. K.

**Applicability of the Kjeldahl process to the determination of nitrogen in biological material.** C. OLSEN (Biochem. Z., 1937, 291, 178–187).—Andersen and Jensen's modification (A., 1926, 375) of the Kjeldahl method gives trustworthy results but that of Smyth and Wilson (A., 1936, 121) gives results as much as 10% low partly because the time of heating is too short. Legumes do not utilise atm. N<sub>2</sub> in the absence of bacteria, Vita's results (A., 1933, 103) being based on an untrustworthy method of N determination. W. McC.

**Influence of certain substances on changes in the nitrogen content of leguminous seeds during germination.** N. VITA and R. SANDRINELLI (G. Biol. ind. agrar. aliment., 1935, 5, 41–51; Chem. Zentr., 1936, i, 3351).—Glucose and sucrose have no influence on the N-fixation of peas and lupins and may even retard the action of other stimulants. Distilled H<sub>2</sub>O in May–June stimulates, and in other months retards, fixation. A. G. P.

**Metabolism of amides in green plants. I. Amides of the tobacco leaf.** H. B. VICKERY, G. W. PUCHER, A. J. WAKEMAN, and C. S. LEAVENWORTH (J. Biol. Chem., 1937, 119, 369–382).—Glutamine (I) and asparagine (II), in this order, are synthesised in daylight, but mainly (II) in the dark, when NH<sub>3</sub> also accumulates in the leaves. A non-N precursor of (II) is present in the leaves and a similar precursor of (I) is produced by photosynthesis. P. G. M.

**Metabolism of purine-nitrogen in fungi. I. Distribution of allantoinase and uricase in**

basidiomycetes. A. BRUNEL (Bull. Soc. Chim. biol., 1937, **19**, 747—756).—Allantoinase is present in many species of fungi, is very unevenly distributed in the organism, and is present to the greatest extent in young non-sporing fungi. Uricase, which is widely distributed in fungi, is very sp. in action, being ineffective with 1- and 7-methyluric acid.

P. W. C.

Production of choline in rye-grass in relation to parasitism. J. CHAZE (Compt. rend., 1937, **204**, 1443—1445).—In the presence of parasites, the caryopses and plantules of *Lolium temulentum* produce choline.

E. M. W.

Formation of citric acid in the makhorka leaf (*Nicotiana rustica*, L.). O. J. SOBOLEVSKAJA and V. S. BUTKEVITSCH (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 157—160).—Formation of citric acid in the leaf during drying occurs at the expense of carbohydrate, and is increased by vac. injection of glucose prior to drying.

A. G. P.

Carotene metabolism of leaves during the whole vegetative cycle. N. T. DELEANO and J. DICK (Biochem. Z., 1937, **290**, 360—363).—Storage of carotene (I) in leaves of willows (*Salix fragilis*) bearing male and female blooms continues for the first 70 days and the (I) content then remains const. until the end of the season. Fully developed leaves of trees bearing male blooms contain 25% more (I) than those of trees bearing female blooms.

P. W. C.

Calculation of assimilation [of carbon dioxide by green leaves] by Boysen-Jensen's method. H. VON DUCKER (Biochem. Z., 1937, **291**, 188—190; cf. Planta, 1933, **21**, 368).—The formula for calculating the amount of CO<sub>2</sub> taken up by a green leaf from the atm. gives trustworthy vals. only when the val. for the normality of the HCl does not differ much from 0.045. Trustworthy vals. are obtained in all cases when the expression  $2n/(L + A)$  is omitted.

W. McC.

Effect of variation of temperature on the respiration of the flower of *Helianthus annuus*. A. G. THAKURTA and B. K. DUTT (Trans. Bose Res. Inst. Calcutta, 1934—1935, **10**, 93—111).—Rise of temp. enhances respiration up to a max. of 52°, marked decline then occurring; followed by cessation and death of the organism at 55°. Seasonal variation has no effect on the crit. temp. max. The temp. coeff. of respiration is fairly const. over the range 32—52°, the optimum temp. for respiration being at 34°.

P. W. C.

Respiration and assimilation of certain water mosses. S. USAMI (Acta phytochim., 1937, **9**, 287—297).—Respiration of *Fontinalis*, *Chiloscyphus*, and *Riccia* is more marked in conductivity H<sub>2</sub>O than in 0.04M-phosphate buffer. Slight increase is caused by glucose, galactose, and sucrose, AcOH and Pr<sup>+</sup>CO<sub>2</sub>H whereas fructose, hexosediphosphoric acid, HCO<sub>2</sub>H, EtCO<sub>2</sub>H, and AcCO<sub>2</sub>H are without influence and H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> and CH<sub>2</sub>(CO<sub>2</sub>H)<sub>2</sub> are restrictive. KCN, alone or in presence of glucose, is somewhat inhibitory. Methylene-blue does not affect respiration, which is hindered by NH<sub>2</sub>·CO<sub>2</sub>Et. Respiration is almost unchanged by 0.002M—0.001M-NH<sub>4</sub>OH whereas

assimilation is completely repressed at the latter concn. At similar concn. KCN has less influence than NH<sub>2</sub>OH on assimilation.

H. W.

Animal hormones and plants. H. NICOL (Chem. and Ind., 1937, 526—527).—A brief review. The term "plant hormone" applied to substances which do not occur naturally in plants is a misnomer.

A. G. P.

Hormonal theory of plant development. II. M. C. TSCHAJLACHJAN and L. M. JARKOVAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 215—217; cf. this vol., 49).—In grafting experiments it is shown that the blossoming of the short-day plant *Helianthus tuberosus* may take place under the influence of hormone formed in the leaves of the long-day sunflower plant. The view is confirmed that blossoming plants represent a source of a blossom forming hormone or florigen and can be utilised as stock for accelerating the blossoming and fruit-bearing in both non-flowering annuals and perennials.

P. W. C.

Photoperiodism and a hypothesis as to hormones of flowering. B. S. MOSCHKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 211—214).—Using species of *Nicotiana* which flower under conditions of a long day and other species, e.g., *N. tabacum*, which flower only under conditions of a short day, and grafts of the two types, it is found that the flower-producing hormone is synthesised by leaves of mature plants, the leaves of the short- and long-day species synthesising the same hormone under their respective conditions. The substance is conveyed within the plant from cell to cell by osmotic processes.

Comparative effectiveness of acids, esters, and salts as growth substances: methods of evaluation. P. W. ZIMMERMAN and A. E. HITCHCOCK (Contr. Boyce Thompson Inst., 1937, **8**, 337—350).—A specially purified sample of  $\alpha$ -naphthylacetic acid (I) compared favourably with indolylacetic acid for inducing bending responses in plants, and was relatively much more active in effecting root initiation. Indolylbutyric acid and (I), and their K, Na, and NH<sub>4</sub> salts, were the most effective, among acids examined, in inducing rooting of cuttings. Salts were slightly less toxic than the corresponding acids and less inhibitory to growth of aerial roots of the tropical grape, *Cissus*. The acids were less active than their salts or esters in *Avena* tests.

A. G. P.

Effect of the roots on the production of auxin by the coleoptile. J. VAN OVERBEEK (Proc. Nat. Acad. Sci., 1937, **23**, 272—276).—The production of auxin (I) by the coleoptiles of *Avena* seedlings is reduced by removal of the root system. This results in reduced growth but an increased sensitivity to (I). Plants from which both roots and seeds have been removed have a lower initial sensitivity, but as no regeneration of (I) takes place, the curvature goes on increasing. Such plants are specially suitable for the detection of small amounts of (I).

W. O. K.

Correlation phenomena and hormones in *Selaginella*. S. WILLIAMS (Nature, 1937, **139**, 966).—Preliminary experiments indicate that the presence or absence of heteroauxin is an effective factor in

determining whether an angle-meristem shall develop as a rhizophore, leafless and positively geotropic, or as a plagiotropic leafy shoot. L. S. T.

**Root production.** O. FISCHNICH (Ber. deut. bot. Ges., 1937, 55, 279—287).—Application of  $\beta$ -indolyl-acetic acid (I) or its Na salt to the mid-rib of *Coleus* leaves stimulates production of roots on the stem beneath. Darkening the leaf or cutting from margin to midrib prevents this action probably by restricting C assimilation and translocation. By placing stems of such darkened or damaged leaves in glucose solution root initiation by (I) is increased.

A. G. P.

**Growth phenomena in plants following injections of heteroauxin ( $\beta$ -indolylacetic acid).** M. M. JANOT (Compt. rend., 1937, 204, 1358—1360).—Synthetic  $\beta$ -indolylacetic acid (0.01% solution) when injected into the conducting system of young shoots of *Polygonum cuspidatum* results in the bending of the shoot which lasts several weeks. The curvature always directs the shoot towards the light.

J. L. D.

**Growth-substances, root production, and cambial activity in woody cuttings.** M. A. H. TINCKER (Nature, 1937, 139, 1104—1105).—Root formation in *Viburnum Carlesii* is stimulated by treatment of cuttings with dil. aq. solutions of  $\alpha$ -naphthyl- (I) or  $\beta$ -indolyl-acetic acid before planting. Photomicrographs showing stimulation of the cambium to marked activity by (I) in cuttings of *Ceanothus dentatus* and *Myrthus communis* are reproduced. Natural seasonal excitation of the cambium may result from the downward translocation of similar growth-substances formed in young leaves.

L. S. T.

**Effect of heteroauxin on the growth of broad bean plants in water culture.** H. L. PEARSE (Nature, 1937, 140, 26).—Heteroauxin (I) supplied to the culture solution in which seedlings of *Vicia faba* are grown retards growth in length of the roots, although the total root wt. remains practically unaltered. Spraying the shoots with (I) slightly decreases the wt. of root growth without altering its form. Shoot growth is retarded by both treatments, but only spraying induces swelling of the stem and epinasty of the leaves. The terminal bud is inhibited by spraying.

L. S. T.

**Skatole as a root-forming substance.** L. G. G. WARNE and A. A. JACKSON (Nature, 1937, 140, 26—27; cf. A., 1936, 532).—Treatment with a solution of skatole (20 mg. per 100 c.c.) accelerates root production in cuttings of *Leptospermum scoparium* and of *Ficus repens*. *l*-Tryptophan is inactive. L. S. T.

**Growth-substance and germination of fruit-tree seeds.** R. VON VEH and H. SODING (Ber. deut. bot. Ges., 1937, 55, 270—278).—Germination of apple seed is not necessarily accompanied by an increased content of growth-substance (I). The inhibitory action of the endosperm on germination is not attributable to its ability to inactivate (I) in the embryo. (I) does not act as a "germination hormone" in apple seeds.

A. G. P.

**Chemical examination of the Indian medicinal plant *Trichosanthes dioeca*.** N. C. NAG (Trans. Bose Res. Inst. Calcutta, 1934—1935, 10, 113—123).—Characteristic variations in the proportions of the mineral constituents occur in the various parts of the plant. The tuber has high  $K_2O$  and  $H_3PO_4$  contents, the stem high  $CaO$ ,  $K_2O$ , and  $Na_2O$  contents, the leaf a high  $SiO_2$  and  $CaO$  content, and the fruit a high  $K_2O$  content, fairly high  $CaO$  and  $H_3PO_4$  content, but only traces of  $SiO_2$ . The roots contain 0.9 and the leaves >4% of N. The type of soil suitable for the growth of this plant is examined. P. W. C.

**Distribution of phosphorus in the starch granule.** C. L. ALSBERG (Proc. Soc. Exp. Biol. Med., 1937, 36, 127—129).—Samples containing granules of different sizes, separated from a prep. of cassava starch, all contained approx. the same  $P_2O_5$  content. There is no evidence that natural, ungelatinised starches possess an insol. membrane rich in P.

W. O. K.

**Species of the genus *Monarda*. III. Ash analyses. IV. Histology of *M. menthaefolia*, var. *leucantha*.** B. V. CHRISTENSEN and R. S. JUSTICE (J. Amer. Pharm. Assoc., 1937, 26, 466—469, 469—474; cf. B., 1937, 497).—III. Data for the ash constituents of different parts of various species are given. A correlation possibly exists between the inorg. (e.g.,  $Ca$ ,  $SO_4$ ) and phenolic constituents.

F. O. H.

**Manganese in the ash of spruce trees.** V. ADAMEK (Papier-Fabr., 1937, 35, 230—231).—Up to about 22% of  $MnO_2$  was found in the ash of spruce trees. The Mn content is paralleled by that of  $P_2O_5$ . Growing conditions (soil, geographical position, sunlight, etc.) appear to have no effect on the Mn content, which in itself is very heterogeneously distributed in the trunk.

D. A. C.

***Chrysopsis graminifolia*, Nutt.** H. D. ROTH and H. M. BURLAGE (J. Amer. Pharm. Assoc., 1937, 26, 415—418).—The plant,  $H_2O$  9.8—10.8, ash 6.26—8.33 (acid-insol. 0.67—4.65), contains N, P, saponins 0.36, reducing substances, and tannins 3.95%.

F. O. H.

**Biological rôle of hydroxylamine. VI. Presence of volatile compounds of hydroxylamine in fresh leaves of higher plants.** M. LEMOIGNE, P. MONGUILLON, and R. DESVEAUX (Bull. Soc. Chim. biol., 1937, 19, 671—674).—An error in the technique employed in an earlier paper (A., 1936, 532) is eliminated and the previous results are confirmed.

P. W. C.

**Localisation of pentosans in the resin glands of the cotton embryo.** R. G. REEVES and J. O. BEASLEY (J. Agric. Res., 1937, 54, 711—718).—Pentosans probably occur in the resin glands but not in any other part of the embryo. The specificity of tests applied is discussed and shown to be inapplicable to resin glands of leaves owing to interference by certain pigments.

A. G. P.

**Organic acids of the ripe banana.** P. L. HARRIS and G. L. POLAND (Food Res., 1937, 2, 135—142).—All, or nearly all, of the non-volatile org. acid

of the ripe banana is *l*-malic acid (I). During ripening the % of (I) increases within the range 0.053—0.373, the titratable acidity increasing from 2.8 to 5.4 ml. of *N*-alkali per 100 g. of fruit. At the stage of ripeness at which it is usually eaten the % of (I) is 0.314 approx. From the stage when the peel is more yellow than green, the titratable acidity = the % of (I). E. C. S.

**Chlorophyll deficiencies in sorghum; xantha and patchy albino.** G. N. R. AYYANGAR and T. V. REDDY (Proc. Indian Acad. Sci., 1937, 5, B, 183—185).—Two chlorophyll-deficient types are described. The xantha type contains chlorophyll 9.7 and xanthophyll 97.8% of the normal amounts. A. G. P.

**Isolation of carotene from a wood oil.** V. M. TRIKOJUS and J. C. DRUMMOND (Nature, 1937, 139, 1105).— $\beta$ -Carotene has been isolated by chromatographic fractionation on  $Al_2O_3$  from the oil extracted from *Acacia acuminata* by light petroleum. L. S. T.

**Membranes of spores and pollens. XI. Constitution of lycopodium sporonin, tasmanin, and Lange sporonin.** F. ZETZSCHE, P. KALT, J. LIECHTI, and E. ZIEGLER (J. pr. Chem., 1937, [ii], 148, 267—286; cf. A., 1932, 784).—Sporopollenins from 5 extant and 3 fossil spores show 1.7—4.5 CMe per mol. (Kuhn-l'Orsa method). The products of ozonisation of lycopodium sporonin (I) and tasmanin (II) differ greatly in solubility. Those from (I) include malonic 1, glutaric 1, adipic 1, and succinic acid 2 mols. (calc. on a  $C_{90}$  mol.), and acids of equiv. wts. 93.2, 96.5 ( $C_7H_{12}O_6$ ), and 112.1. Those from (II) include glutaric <1, adipic <1, and succinic acid 1.78 mols., and resin acids,  $C_{30}H_{46}O_{14}$  and  $C_{20}H_{30}O_9$ . The distribution of *C*-Me in the fossil material is discussed. R. S. C.

**New alcohol from oil of raspberries.** H. MARCELET (Compt. rend., 1937, 204, 1446).—An alcohol,  $C_{19}H_{40}O$ , m.p. 62.5° (benzoate, m.p. 45°; acetate, m.p. 58°; phenylurethane, m.p. 80°), has been isolated from the fatty matter of wild raspberries. E. M. W.

**Bark of Terminalia arjuna, Bedd. II. Isolation of arjunetin from the alcohol extract.** R. R. AGARWAL and S. DUTT (Proc. Nat. Acad. Sci. India, 1936, 6, 304—308).—The bark of *T. arjuna* contains besides arjunin (cf. A., 1936, 395) 0.25% of a lactone arjunetin (I),  $C_{11}H_{18}O_4 \cdot H_2O$ , m.p. 215°, and 1% of an amorphous red colouring matter, m.p. 132°. Saponification and acidification of (I) gives an isomeric compound, m.p. 165°. P. W. C.

**Bark of Aspidosperma quirandy, Hassler. L.** FLORIANI (Rev. centro estud. farm. bioquím., 1935, 25, 373—394, 423—447).—In addition to the common extractives (resins, tannins, etc.) the bark contains a saponin (*quirandy saponin*), the alkaloids aspidospermine and aspidosamine, together with two new cryst. alkaloids *haslerine*, m.p. 237°, and *quirandine*, m.p. 218°, and other uncharacterised alkaloids. Toxicity data (rabbits) for the total alkaloidal extract are given. CH. ABS. (p)

**Determination of coumarin, melilotic acid, and coumaric acid in plant tissue.** W. L. ROBERTS and K. P. LINK (J. Biol. Chem., 1937, 119,

269—281).—A colorimetric method for determining these constituents in sweet clover is based on extraction of the tissue with a solution containing  $COMe_2 + 0.1N-H_2SO_4$  (1:9 by vol.), followed by separation of the constituents with suitable solvents and coupling with diazo-*p*-nitroaniline. P. G. M.

**Coumarin content of Melilotus dentata.** R. A. BRINK and W. L. ROBERTS (Science, 1937, 86, 41—42).—No coumarin (I), melilotic acid, or coumaric acid could be detected at the flowering stage in the vegetative tissues of *M. dentata*, the non-bitter species of clover, from various places. Small amounts of (I) (0.021—0.074% on dry basis) are present in the seed. Comparative data for *M. officinalis* and *M. alba* are given. L. S. T.

**Occurrence of rhapontizin in species of Rheum; its identification in adulterations of rhubarb rhizomes.** P. N. SCHURHOFF and G. PLETTNER (Arch. Pharm., 1937, 275, 281—293).—Rhapontizin (I), being a dihydric methoxy-phenol, gives colours with several aldehydes in  $H_2SO_4$ -EtOH. The bluish-violet colour given by furfuraldehyde is used as a test for (I), either microscopically on the solid or on the aq. EtOH extract. Rhizomes of eleven species of *Rheum* are thus shown to contain (I), which, however, is absent from many others and from the official drug. Results are confirmed by the fluorescence test. Adulteration of *Rheum* drugs by other species can be thus detected. R. S. C.

**Constitution of shonanin acid, one of the two characteristic volatile acids from the wood of Libocedrus formosana, Florin. II. Reduction and bromination of shonanin acid. III. Oxidation of shonanin acid.** N. ICHIKAWA (Bull. Chem. Soc. Japan, 1937, 12, 233—243, 243—252; cf. this vol., 108).—II. Shonanin acid (I) is not reduced by Na-Hg, but with  $C_5H_{11}OH-Na$  (5 atoms) yields 75% of tetra- (II) and 25% of di-hydroshonanin acid (III), whilst with Na (20 atoms), (II) alone is produced. (III) may be reduced to (II) with  $C_5H_{11}OH-Na$  (large excess). (I) yields an oily dibromide (IV), which absorbs no more Br, is reduced (Zn-AcOH) to (I), and on heating to 40—50°/40—50 mm. affords a monobromolactone,  $C_{10}H_{13}O_2Br$ , which with Br-AcOH gives a tribromolactone, m.p. 212°. Distillation of (IV) affords *p*-cuminic acid, and oxidation (aq.  $KMnO_4$ ) an acid,  $C_6H_8O_3Br$ , m.p. 239° (decomp.).

III. Oxidation of (I) (aq.  $KMnO_4$ ) affords  $CMe_2(CO_2H)_2$  and  $HCO_2H$ ; the acid chloride of (I) is reduced ( $Pd-BaSO_4-H_2$ ) to an aldehyde,  $C_{10}H_{18}O$ , b.p. 73°/5 mm. (*semicarbazone*, m.p. 165°). Reduction of (I) or (II) with  $HI-P$  affords a hydrocarbon  $C_{10}H_{20}$ , b.p. 157—158.5°/754 mm., whilst (II) distilled with soda-lime yields an unsaturated hydrocarbon,  $C_8H_{16}$ , b.p. 144.5—145°/757 mm. (I) heated with  $HNO_3$  yields *o*- $C_6H_4(NO_2)_2$ . J. D. R.

**Chemical characteristics of Euphorbia lathyris, L., as an oleaginous plant.** N. F. DUBLJANSKAJA (Biochimia, 1937, 2, 521—536).—The seeds contain 50%, and the kernels 70%, of a toxic oil, consisting of glycerides of oleic 64—87, saturated 8—20, and linoleic acid 4—17%, with 0.45—0.88%

of unsaponifiable lipins from which a substance,  $C_{18}H_{35}O_7$ , m.p.  $199.7^\circ$  ("euphorbiosteroid"), is isolated. The leaves and flowers of the plant contain 18% of resins and 0.15–0.26% of rubber-like substances.

R. T.

**Acorns of *Quercus rubra*.** C. J. MONARCA and E. V. LYNN (J. Amer. Pharm. Assoc., 1937, 26, 493–495).—The kernels,  $H_2O$  11.02, protein 4.41, starch 28.23, tannin 11.74%, yielded 11% of an oil,  $d^{25}_4$  0.9141,  $n^{20}_D$  1.4725, sap. val. 195.3, acid val. 4.5, I val. 100.1, Reichert–Meissl val. 1.1, Polenske val. 0.8, unsaponifiable content 0.9%.

F. O. H.

**New unsaturated fatty acid  $C_{10}H_{18}O_2$  in the oil of *Rindera obtusiloba*.** S. KOMORI and S. I. UENO (Bull. Chem. Soc. Japan, 1937, 12, 226).—From the unsaturated fatty acids of the saponified oil is isolated  $\Delta^7$ -decanoic acid (I), hydrogenated to decanoic acid and oxidised ( $KMnO_4$  in  $COMe_2$ ) to succinic and hexoic acids. The name "obtusilic acid" is proposed for (I).

J. D. R.

**Species of *Monarda*. II. Alcoholic extractive and miscellaneous determinations.** B. V. CHRISTENSEN and R. S. JUSTICE (J. Amer. Pharm. Assoc., 1937, 26, 387–394; cf. B., 1937, 101).—The 95% EtOH extract of the leaves and flowers of *M. menthaefolia* yields a volatile oil, linoleic and oleic acid, thymoquinol (I), solid fatty acids, and two pigments, m.p.  $216$ – $218^\circ$  and  $204$ – $205^\circ$ , respectively. Somewhat similar substances, but not (I), are present in the extract of the entire plant of *M. punctata*, var. *leucantha*. The pentosan, crude fibre, and tannin contents of *M. menthaefolia* were determined.

F. O. H.

**Essential oils from the leaves of *Languas* (*Alpinia*) varieties.** A. J. ULTÉE (Rec. trav. chim., 1937, 56, 409–412; cf. this vol., 81).—The oils contain  $\alpha$ - and  $\beta$ -pinene, cineole, camphor, borneol, and Me cinnamate.

J. L. D.

**Yield of essential oil by a new variety of dragonhead (*Dracocephalum Moldavica*, L., var. *hexagonum*, D. Vakulin) from different seed samples.** D. J. VAKULIN (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 203–205).—The yield of essential oil varies from 0.133 to 0.627% of the dry wt. The hexagonal-stemmed variety always gave a higher yield of oil than the common square-stemmed type both in full flower and at the stage of fading.

P. W. C.

**Oil from resin of *Pistacia terebinthus*.** G. TSATSAS (J. Pharm. Chim., 1937, 25, [viii], 595–599).—The fresh resin contains approx. 12% of oil which consists mainly of  $d$ -pinene, together with dipentene and small amounts of borneol and bornyl acetate.

J. N. A.

**$d$ -Galacturonic acid from peels of Chinese pomelo.** P. P. T. SAH and H. Y. FANG (J. Chinese Chem. Soc., 1937, 5, 107–115).— $d$ -Galacturonic acid, isolated from peels of *Citrus aurantium*, var. *decumana*, by extraction with hot 60% EtOH, hydrolysis of the dried residue (100 g.), and pptn. as the Ba salt (30 g.), was characterised by the  $p$ -tolylhydrazone of its  $p$ -tolylhydrazinum salt, decomp.  $122^\circ$ , the corre-

sponding phenylhydrazone, and its oxanilhydrazone, decomp.  $212$ – $214^\circ$ .

A. LI.

**Determination of sugars in plants.** W. Z. HASSID (Ind. Eng. Chem. [Anal.], 1937, 9, 228–229).—The method previously described (A., 1936, 650) is modified by using Setopaline C as indicator and reducing the excess of alkaline ferricyanide.

F. N. W.

**Fucoidin.** G. LUNDE, E. HEEN, and E. ØY (Z. physiol. Chem., 1937, 247, 189–196).—Fucoidin, from the leaves of *Laminaria digitata*, is a carbohydrate sulphuric ester of the type  $RO-SO_2-OR'$  where R consists of 60% of fucose and R' is mainly Na, some K, and small amounts of Ca and Mg (cf. Bird and Haas, A., 1931, 776).

F. O. H.

**Araban of wheat flour.** R. GEOFFROY (Bull. Soc. Chim. biol., 1937, 19, 60–64).—The araban,  $[\alpha]_D$  approx.  $-50^\circ$ , in wheat flour (cf. B., 1935, 121), isolated by fractional pptn. of aq. extracts by EtOH, is not hydrolysed by yeast (under baking conditions) and only slowly by warm dil. acids.

F. O. H.

**Levosin from wheat.** H. COLIN and H. BELVAL (Bull. Soc. Chim. biol., 1937, 19, 65–68; cf. A., 1935, 1290).—White flour contains 0.6% of levosin (I), 0.2–0.3% of sucrose, and 0.1% of reducing sugars. Under baking conditions, (I) is slowly fermented, >50% being decomposed in 4 hr.

F. O. H.

**Differentiation of carbohydrate complexes on micro-analysis of plant materials.** S. M. STREPKOV (Biochem. Z., 1937, 290, 378–381, and Z. anal. Chem., 1937, 108, 406–408).—The apparatus described permits the micro-determination of 7 fractions of a carbohydrate complex, viz., material sol. in hot EtOH, sol. in cold  $H_2O$  but insol. in EtOH, sol. in warm  $H_2O$ , hydrolysable by diastase, sol. in hot  $H_2O$ , hydrolysable by 2%  $H_2SO_4$ , and not hydrolysable by dil.  $H_2SO_4$ . The method gave good results in determination of the constituents of a mixture of sucrose, erythrodextrin, inulin, potato starch, and cellulose.

P. W. C.

**Pectin compounds of cotton.** M. M. TSCHELILIKIN and Z. S. ROZOVA (J. Appl. Chem. Russ., 1937, 10, 709–716).—Cotton contains 0.46% of pectic acids, not extracted by  $H_2O$  at  $40^\circ$ , and only partially extracted at  $100^\circ$ . Complete extraction, with decomp. of pectins, is achieved by autoclaving, or with boiling aq. NaOH or  $NaHCO_3$ . The pectin yields galacturonic acid, arabinose, xylose, and fructose when hydrolysed. Pectins do not interfere with bleaching of cotton.

R. T.

**Fruits of *Physalis Peruviana* or Cape gooseberry.** I. J. B. LAL (Proc. Nat. Acad. Sci. India, 1936, 6, 309–313).—The juice of ripe berries of *P. Peruviana* contains large amounts of pectin and pectinase, 3–4% of free glucose, 13.2–17% of total glucose after hydrolysis, 2.6% of citric acid, malic and traces of tartaric acids, but no  $H_2C_2O_4$ , BzOH, or salicylic acid.

P. W. C.

**Identification of crystalline cellulose in young cotton fibres by X-ray diffraction analysis.** W. A. SISSON (Contr. Boyce Thompson Inst., 1937, 8, 389–400).—The cellulose (I) X-ray diagram in young cotton fibres is obscured by a cryst. "wax-

pattern" which is removed by  $\text{CHCl}_3$ , and by an amorphous diagram which is removed by treatment with 1% aq. NaOH and bleaching with 2% aq. NaOCl. The crystallographic identity of (I) from young purified fibres with that of mature (I) is established. (I) is first formed in the cytoplasm as cryst. (I) and, once formed, is not modified during growth. A. G. P.

**Structure of cotton fibres in the dark [microscope] field.** B. RABINOWITSCH (Contr. Boyce Thompson Inst., 1937, 8, 401—403).—In young fibres cellulose (I) particles occur chiefly as uncombined units, which tend to form chains as growth proceeds. In the disintegration of mature fibres the breakdown of membrane layers into fibrils and thence into (I) particles is observed. A. G. P.

**Distribution of saponins in plant drugs.** M. ROBERG (Ber. deut. bot. Ges., 1937, 55, 299—309).—The qual. distribution of saponin in various parts of plants of pharmaceutical interest is tabulated.

F. O. H.

**Verbenalloside content of the cortex of roots of *Cornus florida*, L. Examination of the cortex of roots of *Cornus mas*, L., and *Cornus sanguinea*, L., for this heteroside.** J. CHEYMOL (J. Pharm. Chim., 1937, [viii], 25, 5—11; cf. A., 1937, II, 7; this vol., 161).—The identity of cornin from the root cortex (I) of *Cornus florida*, L., with verbenalin (II) (cf. A., 1935, 1041) is confirmed; the name *verbenalloside* is preferred for (II). The aerial parts of European vervain contain three times as much (II) as does (I). In the root cortex of *C. mas*, L., and *C. sanguinea*, L., (II) is not detected.

E. W. W.

**Drying of *Verbena officinalis*, L. Decrease in holosides and verbenalloside. Slight increase in sugars.** J. CHEYMOL (J. Pharm. Chim., 1937, [viii], 25, 581—586).—Air drying of the aerial parts of vervain slightly increased the amount of reducing sugars due to hydrolysis of holosides, which decreased by 18.9%; verbenalloside decreased by 28.7%. Roots contained larger amounts of sugars and in these the holosides and verbenalloside decreased by 3.3% and 9.5% respectively on drying. J. N. A.

**Scoparin (scoparoside) from *Sarothamnus scoparius*, Koch.** M. MASCRE and R. PARIS (Compt. rend., 1937, 204, 1270—1271; cf. A., 1927, 248).—An improved method of isolating scoparin,  $\text{C}_{22}\text{H}_{22}\text{O}_{11} \cdot 2\text{H}_2\text{O}$ , m.p.  $230^\circ$  (block), and many of its reactions are described. Enzymic hydrolysis affords a methylpentose and a flavin. J. L. D.

**Occurrence and distribution of saponins in seed drugs.** M. ROBERG (Arch. Pharm., 1937, 275, 328—336).—Saponins are shown by the blood-gelatin test to be present in the seeds of *Agrostemma*, *Albizia*, *Chenopodium*, *Digitalis*, fenugreek, horse-chestnut, *Kaladana*, *Momordica*, *Nigella sativa* and *N. damascena*, *Strophanthus hispidus* and *S. kombe*, and *Thea*, but absent from 36 other seed drugs.

R. S. C.

**Crystalline globulin from *P. aconitifolius*, Jacq.** K. BHAGVAT (Current Sci., 1937, 5, 587).—A cryst. globulin (total N 15.99%; tyrosine- and tryptophan-N, 2.6 and 0.5% of total N, respectively) has been isolated from the seeds of aconite bean.

F. R. S.

**Ricin.** S. INOUE (J. Soc. Chem. Ind. Japan, 1937, 40, 122—123B).—The protein nature of ricin (I), a toxin from the castor-oil bean, is established. The coagulation of red blood corpuscles by (I) is most complete at  $p_H$  5.6—5.8 and  $p_H$  8.9—9.1 (isoelectric point for (I) preps. = 5.4—5.6). E. M. W.

**Anthocyanins as biological hydrogen acceptors.** L. REICHEL [with W. BURKART] (Naturwiss., 1937, 25, 318).—Anthocyanins and anthocyanidins (I) are decolorised by yeast or liver in evacuated tubes at  $37^\circ$  and the leuco-forms undergo dehydrogenation on exposure to air. The times of decolorisation for cyanidin, delphinidin, and pelargonidin chlorides are respectively 50, 70, and 80 min. In presence of (I), aldehydes are converted into acids. P. W. C.

**[Qualitative] distribution of anthocyanins in the red variety of the yellow bird's-nest (*Monotropa hypopitys*, var. *sanguinea* Hausskn.) compared with that of other plants.** G. FUNK (Ber. deut. bot. Ges., 1937, 55, 322—328). F. O. H.

**Colouring matter of red beetroot.** O. T. SCHMIDT (Naturwiss., 1937, 25, 284).—Betanin purified through its dichloropicate contains N 5.4% and  $\text{NH}_2\text{-N}$  2.7%. The results are consistent with the formula suggested by Ainley and Robinson (A., 1937, ii, 206). W. O. K.

**Variability in carotenoid pigment content of individual plants of *Triticum vulgare* and *T. durum*.** M. C. MARKLEY (Cereal Chem., 1937, 14, 400—409).—An account is given of wheat breeding experiments on the inheritance of carotenoid pigments. In F-2 plants from durum crosses, after corrections for kernel wt., Mendelian ratios were not found. Multiple factor inheritance was found in durum wheats. Crosses between highly pigmented Mindum durum and less pigmented Mindum  $\times$  Pentad give some highly pigmented F-2 plants. E. A. F.

**Constitution of herbacitrin and herbacetin.**—See A., II, 326.

**Practical device for the rapid determination of plant pigments.** W. A. BECK (Science, 1937, 85, 368).—The relative transmission of filtered light is measured. L. S. T.

**Alkaloids of *Heliotropium lasiocarpum* and *Trichodesma incanum*.** G. MENSCHIKOV (Bull. Acad. Sci. U.R.S.S., 1936, 969—981).—Previously published work (Menschikov *et al.*, 1932—1936) is reviewed. R. T.

**Synthesis of *dl*-lupinine and *dl*-isolupinine.**—See A., II, 355.

**Constitution of nymphaëine.**—See A., II, 355.

**The Henriot and Huguenard ultra-centrifuge in biological investigations.** A. GRATTA (Compt. rend. Soc. Biol., 1937, 125, 371—375).—Modifications for determining the rate of sedimentation are described. H. G. R.

**Uses of sheet viscose in microbiological technique.** L. D. GALLOWAY (Analyst, 1937, 62, 455—456).—Its use is suggested for the microscopical examination of fungi, the study of spore germination, and for the isolation of single-spore cultures.

E. C. S

**Culture of human marrow.** E. E. OSGOOD and I. E. BROWNLEE (J. Amer. Med. Assoc., 1937, 108, 1793—1796).—Marrow cells are grown in 35% cord serum containing various salts. The effect of addition of other substances is described. E. M. W.

**Rapid embedding with hot low-viscosity nitrocellulose.** A. A. KONEFF and W. R. LYONS (Stain Tech., 1937, 12, 57—59).—Fixation, dehydration, infiltration, and embedding can be carried out in 30 hr. by using low- $\eta$  cellulose nitrate at 56°. E. M. W.

**Biological stain for general purposes.** H. G. CANNON (Nature, 1937, 139, 549).—Chlorazol-black E stains nuclei and chromosomes black, cytoplasm and secreted products grey, chitin green, and glycogen pink or red. No mordant and no differentiation are required. L. S. T.

**Paraffin sections of formol-fixed insect material.** J. A. MURRAY (J. Roy. Microscop. Soc., 1937, [iii], 57, 15).—Softening of chitin by chloral hydrate-PhOH is effective on  $\text{CH}_2\text{O}$ -fixed material without damage to the tissues and persists after embedding in paraffin. The detailed technique is given. N. M. B.

**Vital staining of vacuoles by neutral-red.** A. GUILLIERMOND and R. GAUTHERET (Compt. rend., 1937, 204, 1377—1381).—Cultivation of mushrooms in media containing neutral-red shows that vital staining takes place only when growth is either arrested or, in the case of *Saprolegnia*, comparatively slow. E. M. W.

**Automatic dehydrating device [for tissues].** J. PENNINGTON and C. P. HICKMAN (Science, 1937, 85, 249—250). L. S. T.

**Micro-tonometer.** M. N. J. DIRKEN and J. K. KRAAN (Biochem. Z., 1937, 290, 269—271; cf. Mook, A., 1932, 72, 76).—An apparatus of 6 c.c. capacity and applicable to 0.2 c.c. of blood is described. The accuracy attained is  $\leq$  that of macro-methods. W. McC.

**Some recent developments in electrokinetic methods and their application to biology and medicine.** H. A. ABRAMSON and L. S. MOYER (Trans. Electrochem. Soc., 1937, 71, Preprint 12, 115—131).—New developments in the study of electrophoresis and electro-osmosis are critically discussed in regard to the examination of bacteria, blood cells, proteins, and other substances of biological interest. J. W. C.

**Determination of sulphanilamide in blood and urine.** E. K. MARSHALL, jun. (Proc. Soc. Exp. Biol. Med., 1937, 36, 422—424).—The sensitivity and stability of the method (this vol., 211) have been increased. H. G. R.

**Colorimetric determination of uric acid.**—See A., II, 360.

**Determination of alcohol in blood and tissues.** U. FABRIS (Arch. Ist. Biochim. Ital., 1937, 9, 81—98).—The  $\text{EtOH}$ , when obtained as an aq. distillate, is heated with  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{H}_2\text{SO}_4$  and the products of oxidation are passed through  $\text{AgNO}_3$ - $\text{NaOH}$ - $\text{NH}_3$  reagent, the pptd. Ag being separated, washed, dissolved in  $\text{HNO}_3$ , and titrated with 0.1N-KCNS, 1 c.c. of which is equiv. to 0.0023 g. of  $\text{EtOH}$ . F. O. H.

**Determination of small amounts of chloral in biological substances.** L. OLSZYCKA (Bull. Soc. Chim. biol., 1937, 19, 731—738).—A method for determination of 0.2—4 mg. of chloral in blood and tissues is described, the error being  $<4\%$ . The tissue is extracted with  $\text{EtOH}$ - $\text{COMe}_2$ , the inorg. Cl' of the extract pptd. with excess of  $\text{AgNO}_3$  and removed, the chloral in the filtrate treated with  $\text{NaOEt}$ , and the Cl pptd. as  $\text{AgCl}$ ; this is then dissolved and titrated with KCNS. P. W. C.

**Apparatus for the extraction of lipins from liquids with an immiscible solvent.** H. WU and C. Y. CHOU (Chinese J. Physiol., 1937, 11, 409—412). J. L. C.

**Determination of total lipins and their constituents in small amounts of tissues.** P. MONNIER (Compt. rend. Soc. Biol., 1937, 124, 1138—1140).—Methods using 1—2 g. of tissue are described. H. G. R.

**Conductometric determination of micro-quantities of arginine.** V. RANGANATHAN (Proc. Indian Acad. Sci., 1937, 5, B, 224—230).—The method previously described for urea (this vol., 52) is adapted to the determination of arginine and depends on the change in conductivity of protein hydrolysates effected by addition of arginase and urease.  $0.5 \times 10^{-4}$  g. of arginine may be determined within 1%. Results agree with those obtained by the method of Hunter and Dauphinee (A., 1930, 373). A. G. P.

**Determination of perchlorates. Application to biological substances.** J. DURAND (Bull. Soc. Chim. biol., 1937, 19, 739—746).—The Cl' and  $\text{ClO}_4'$  are extracted with  $\text{EtOH}$ - $\text{COMe}_2$ , the Cl' is removed with  $\text{AgNO}_3$ , the  $\text{ClO}_4'$  reduced to Cl' by boiling with S in conc.  $\text{H}_2\text{SO}_4$ , and titrated by Vohld's method. The method is used to follow the rate of elimination of  $\text{ClO}_4'$  by man. P. W. C.

**Determination of bromine in biological substances.** P. S. WINNEK and A. H. SMITH (J. Biol. Chem., 1937, 119, 93—101).—Modifications of Dixon's method (A., 1934, 338) are described. The Br content of various foodstuffs is given. J. N. A.

**Micro-determination of iodine in biological material.** H. DOERING (Biochem. Z., 1937, 291, 219—220).—A reply to Lohr and Wilmans (this vol., 288). W. McC.

**Spectrographic determination of sodium, potassium, calcium, and magnesium in biological fluids.** K. B. THOMSON and W. C. LEE (J. Biol. Chem., 1937, 118, 711—721).—A method similar to that of Duffendack *et al.* (A., 1936, 41) and a rotating jet from which the solution examined flows during the sparking are described. The average error for Na and K is  $<3\%$  of the amount present and for Ca and Mg somewhat greater. W. McC.

**Application of dye reagents to microchemical detection of magnesium in tissues and plant-cells.** B. BRODA (Wiadom. farm., 1936, 63, 6—7, 15—17; Chem. Zentr., 1936, i, 3374—3375).—The use of quinalizarin, titan-yellow, and azo-blue is described. H. N. R.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

SEPTEMBER, 1937.

Biological basis of individuality. L. LOEB (Science, 1937, 86, 1—5). L. S. T.

Mechanism of the peripheral vascular responses to changes in blood-gas tension in man. B. BOLTON, E. A. CARMICHAEL, and D. J. WILLIAMS (J. Physiol., 1936, 88, 113—126). R. N. C.

Oxygen and carbon dioxide subcutaneous tissue gas tensions in cases of hypertension. P. ELLMAN and J. H. TAYLOR (J. Hyg., 1937, 37, 369—371).—Results from 22 patients show that subcutaneous CO<sub>2</sub> and O<sub>2</sub> gas tensions lie within normal limits (CO<sub>2</sub> 40 mm., O<sub>2</sub> 40—43 mm. Hg). Capillary walls are not thickened and capillary blood flow is normal. W. L. D.

Regulated oxygen transport in two cases of congenital circulatory defect. C. S. HICKS and C. I. COX (Austral. J. Exp. Biol., 1937, 15, 141—157).—Investigation of blood equilibria reveals a complex system of adaptations in face of a lowered arterial O<sub>2</sub> pressure consequent on mixing of arterial and venous blood. The O<sub>2</sub> dissociation curve is shifted to bring the steep region into action in the capillaries; the polycythæmia assists the tissue oxygenation by further increasing the O<sub>2</sub> available at the low pressure head which is maintained and further by slowing the circulation on account of increased viscosity which increases the total O<sub>2</sub> utilisation. The extra hæmoglobin buffers the greater amount of CO<sub>2</sub> thus removed. The weakest points in the system are the mechanical strain from the viscosity of the blood and the lowering of alveolar CO<sub>2</sub> which is apt to develop following anoxia of the carotid sinus. R. M. M. O.

Carbamino-compounds of carbon dioxide with human hæmoglobin and their rôle in the transport of carbon dioxide. J. K. W. FERGUSON (J. Physiol., 1936, 88, 40—55).—Carbamino-compounds (I) of CO<sub>2</sub> with human hæmoglobin (II) can be determined in solutions of (II) by the Ba method if suitable methods are adopted to overcome the "protective action" of (II) on the BaCO<sub>3</sub> ppt. The method can be applied to solutions of low total CO<sub>2</sub> content. (I) from human and ox-(II) are similar in general properties; oxygenation reduces the affinity of (II) for CO<sub>2</sub> in both. The amount of CO<sub>2</sub> combining with human (II) is > that previously reported for ox-(II). (I) are responsible for about 30% of the total CO<sub>2</sub> transport in resting conditions, and about 75% of the transport in the erythrocytes. R. N. C.

Study of blood-gases with a new micro-apparatus. I. Modification of the Harington

and Van Slyke extraction chamber. II. Gaseous content of arterial, cutaneous, and venous blood in the normal state, acidosis, and alkalosis. K. SATO (J. Biochem. Japan, 1937, 25, 79—87, 89—94).—I. An apparatus applicable to samples of 0.1 c.c. is described (cf. A., 1924, ii, 872).

II. Data for men and rabbits are tabulated.

Rate of maturation of young red cells in canaries. R. HEGNER and R. HEWITT (Science, 1937, 85, 568—569).—For peripheral blood, the period required is <24 hr. in both parasitised (malaria) and non-parasitised cells. L. S. T.

Method for fixing neutral-red in supra-vital stained blood smears. A. HJARRE and H. BERTHESEN (Nature, 1937, 140, 155).—The method described, of staining smears with neutral-red, permits the differentiation of lymphocytes and small monocytes, and indicates qual. changes in the white blood corpuscles. L. S. T.

Influence of electrolytes on the oxygen dissociation of hæmoglobin. E. S. G. BARRON, R. MUNCH, and A. E. SIDWELL, jun. (Science, 1937, 86, 39—40).—Curves showing the effect of anions on the oxidation-reduction potential of blood-hæmin (I) and on the O<sub>2</sub> dissociation of hæmoglobin (II) are given. On combining with PO<sub>4</sub><sup>'''</sup> and borate (I) forms complex compounds possessing different free energies, whilst (II) combines with Cl<sup>'</sup>, SO<sub>4</sub><sup>''</sup>, PO<sub>4</sub><sup>'''</sup>, HCO<sub>3</sub><sup>'</sup>, and citrate to form complex compounds with different dissociation consts. for the reactions Hb + anion ⇌ Hb anion and Hb anion + O<sub>2</sub> ⇌ Hb anion O<sub>2</sub>. Previous attempts to interpret the equilibrium between O<sub>2</sub> and (II) have failed because the effect of electrolytes on the equilibrium by formation of complex compounds has been neglected. L. S. T.

Alkaline resistance and spreading velocity of foetal and adult types of mammalian hæmoglobin. R. BRINKMAN and J. H. P. JONXIS (J. Physiol., 1936, 88, 162—166).—The rate of denaturation of the hæmoglobin (I) of the young goat by alkali is > that of the maternal (I), but tends to increase with the age of the animal. The spreading velocities of the foetal and maternal (I) at the isoelectric point differ from one another in the goat, cow, rabbit, and man, but not in the cat. R. N. C.

Ætioporphyrin and hæmoglobin regeneration after hæmorrhage. J. H. HUGHES and A. L. LATNER (J. Physiol., 1937, 89, 403—406).—Ætioporphyrin accelerates hæmoglobin regeneration in rabbits. R. N. C.

**Comparative determination of hæmoglobin in human anæmias by the colorimetric and iron methods.** R. DAMADE, L. SERVANTIE, and A. PITOUS (Compt. rend. Soc. Biol., 1937, **125**, 754—756).—Concordant results were obtained by the various methods with the exception of that of Sahli (cf. A., 1936, 355).  
H. G. R.

**Oxyporphyrin-hæmatin compound as intermediate between protohæmatin and verdo-hæmatin.** R. LEMBERG, B. CORTIS-JONES, and M. NORRIE (Nature, 1937, **140**, 65—66).—The hæmo-chromogen obtained by reduction of the compound (cf. this vol., 364) with the absorption band at 639  $\mu$  is not protohæmochromogen but a hæmochromogen of a new type. This is rapidly oxidised by atm.  $O_2$  to verdohæmochromogen, and on splitting with HCl in absence of  $O_2$  it affords an oxyporphyrin resembling those obtained by H. Fischer *et al.* by the action of  $H_2O_2$  on porphyrins in conc.  $H_2SO_4$ . The new hæmochromogen is probably the Fe complex salt of an oxyporphyrin carrying OH on the  $\alpha$ -methene group. The compound with the absorption band at 639  $\mu$  is the ferric hæmochromogen of the oxyporphyrin, and not a hæm- $H_2O_2$  compound (cf. *loc. cit.*).  
L. S. T.

**Determination of bilirubin with the photo-electric colorimeter.** H. T. MALLOY and K. A. EVELYN (J. Biol. Chem., 1937, **119**, 481—490).—The photo-electric determination of bilirubin (I) in serum by means of its colour reaction with  $Ph \cdot N_2 \cdot SO_3H$  is described. A light filter is used to overcome the interference of yellow pigments. The presence of sufficient MeOH (50%) ensures the reaction of all the (I) even in the presence of serum-proteins. P. G. M.

**Phase-rule study of serum-proteins: effect of changes in certain variables.** E. JAMESON (J. Gen. Physiol., 1937, **20**, 859—877; cf. this vol., 111).—The solubility curves of serum-proteins studied under different conditions of temp., and concn. of protein, using K citrate and  $(NH_4)_2SO_4$  as precipitants, have been used to determine the effect of these conditions on the four fractions (*loc. cit.*).  
E. M. W.

**Effect of parathyroid extract on the surface tension of plasma, its fibrinogen content, and the protein present as globulin.** E. ZUNZ, R. BONNYNS, and L. GILLO (Arch. internat. Physiol., 1937, **44**, 232—248).—Intramuscular or intravenous injection of parathyroid extract increases  $\gamma$  and the fibrinogen and globulin content of rabbit's plasma.  
H. G. R.

**Micro-determination of total protein, albumin, and globulin of [blood-]serum or -plasma.** M. FLORKIN and J. GOMEZ (Arch. internat. Physiol., 1937, **44**, 547—550).—Total protein and albumin are determined by a micro-Kjeldahl method, using a special Kjeldahl flask for pptn. and subsequent operations. Globulin is determined by difference.  
H. G. R.

**Determination of histamine in the blood.** C. F. CODE (J. Physiol., 1937, **89**, 257—268).—The method of Barsoum and Gaddum (cf. A., 1936, 496) for extracting histamine is considerably simplified.  
R. N. C.

**Biochemistry of choline and its derivatives.**  
**V. Presence of acetylcholine in a latent state in blood.** E. KAHANE and J. LEVY (Bull. Soc. Chim. biol., 1937, **19**, 777—786; cf. A., 1936, 875).—The extracts obtained from the blood of various animals by treatment with boiling  $H_2O$  and pptn. of the protein and mineral substances with EtOH are shown by pharmacological tests and by their behaviour towards aq. NaOH, heat, and horse serum to contain acetylcholine. The mechanism of the formation during the extraction is discussed.  
A. L.

**Micro-photometric determination of amino-acids [in blood].** M. FLORKIN (Arch. internat. Physiol., 1937, **44**, 551—556).—The method of Danielson (A., 1933, 965) is modified, using the Pulfrich photometer.  
H. G. R.

**Submicro-photometric method for determining uric acid in blood-plasma.** M. FLORKIN (Arch. internat. Physiol., 1937, **44**, 542—546).—The method is a modification of Benedict's and Borsook's (A., 1935, 1140) methods using the Pulfrich photometer.  
H. G. R.

**Distribution of urea in blood and aqueous humour.** G. H. BENHAM (Biochem. J., 1937, **31**, 1157—1160).—Aq. humour (cat, dog, rabbit) contains only slightly less (80—95%) urea than does serum. The vals. present further evidence in support of the dialysis theory as regards blood and aq. humour.  
P. W. C.

**Determination of blood-galactose.** S. SUGAWARA (J. Biochem. Japan, 1937, **25**, 11—21).—Glucose is removed by fermentation with Fleischmann's yeast and then galactose by fermentation with saké-yeast IV, reducing vals. being determined at each stage.  
F. O. H.

**Fermentable, hydrolysable sugar in blood and its micro-determination.** R. OHTA (J. Biochem. Japan, 1937, **25**, 1—9).—The sugar is determined in plasma or serum by removing free sugar by yeast fermentation, autoclaving the residue at 120° for 30 min. with  $H_2SO_4$ , and, following deproteinisation ( $H_2WO_4$ ), determining the difference in reducing val. (Hagedorn-Jensen) of the hydrolysate before and after yeast-fermentation. The content in rabbits' serum (normally 0.06—0.09%) is unchanged by injection of insulin or adrenaline but is significantly decreased by starvation.  
F. O. H.

**Determination of acetone in blood and urine.** J. C. ABELS (J. Biol. Chem., 1937, **119**, 663—667).—The  $COMe_2$  in blood or (acidified) urine (0.5 ml.) is absorbed in 5% aq.  $NaHSO_3$ , which is then treated with Nessler's solution, the turbidity produced being compared with standards from known amounts of  $COMe_2$ .  
F. O. H.

**Blood-alcohol curve following gastric and duodenal administration of alcoholic beverages.** G. LOLLI (Atti R. Acad. Lincei, 1936, [vi], **24**, 523—526).—With fasting men, the height of the blood-alcohol curve and the rapidity of absorption are greatest after duodenal and least after oral administration of 0.5 c.c. of EtOH (in 20% aq. solution) per kg. body-wt.: gastric administration gives intermediate vals.  
F. O. H.

**Examination for and determination of alcohol in blood *post-mortem*.** KOHN-ABREST and L. TRUFFERT (Ann. Falsif., 1937, 30, 210—216).—Blood (or the organ) is repeatedly distilled and the final distillate treated with  $K_2CO_3$ . The vol. of the EtOH which separates is measured in a graduated elongation of the collecting flask. Phenolphthalein is added to facilitate measurement. If the material is putrified, a correction is applied for impurities included in the EtOH layer. E. C. S.

**Technique and forensic significance of the detection of blood-alcohol by Widmark's method.** W. NEUGEBAUER (Mikrochem., 1937, 22, 145—158).—A review. J. S. A.

**Transformation of adenosinetriphosphoric acid in nucleated erythrocytes.** O. I. FEIN-SCHMIDT and A. I. TSCHERNIAK (Biochimia, 1937, 2, 509—513).—The  $H_4P_2O_7$ - and  $H_3PO_4$ -P and glucose contents of turtle blood are respectively 4.0—4.8, 11.0—15.3, and 24—50 mg. per 100 c.c. during hibernation, and 8.2—10.8, 3.5—5.4, and 60—64 mg. during the summer. It is concluded that resynthesis of adenosinetriphosphoric acid is inhibited during hibernation. R. T.

**Increase of blood-calcium after intravenous administration of glucose.** S. C. SEN and P. N. CHAUDHURY (Indian J. Med. Res., 1937, 24, 845—853).—The increase of blood-Ca produced in rabbits by glucose (I) is inhibited by injection of adrenaline (II) previous to or immediately after (I), and when established is slowly restored to normal by (II). (II) alone does not affect -Ca. The alkalinity of the blood is increased on injection of (I), and of (II) when -Ca is high, but falls to normal vals. simultaneously with -Ca. Alkali alone does not affect -Ca or the alkalinity. Blood- $PO_4'''$  falls whenever -Ca rises. (I) possibly stimulates, whilst (II) inhibits, the effect of the pancreas on the parathyroids. R. N. C.

**Changes in magnesium and calcium of blood-serum under different conditions of work.** A. PLESCHTIZER (Arch. Gewerbepath. Gewerbhyg., 1936, 7, 284—295).—Workers exposed to a brickworks dust containing Ca and Mg showed much more Ca and Mg in the blood-serum than workers not so exposed. Temp. differences and manual labour had only a small effect on the increase in serum-Mg. M. A. B.

**Effects on the human electrocardiogram of the introduction of calcium and potassium into the blood.** I. HARRIS and D. A. LEVIN (J. Physiol., 1937, 89, 153—159).—Ca and K both reduce the heart-rate; their concns. cannot be correlated with the magnitude of the changes in the electrocardiogram. R. N. C.

**Determination and the value of the erythrocyte-plasma chloride ratio.** M. PAGET (Bull. Soc. Chim. biol., 1937, 19, 787—799).—Errors in the determination due to the use of Na citrate and oxalate as anticoagulants, and isotonic glucose solution for washing the erythrocytes, are indicated. An improved technique in which polymerised Na anetholedisulphonate is used is described. A. L.

**Blood-chloride.** H. CHABANIER, C. O. GUILLAUMIN, M. LAUDAT, M. LÉVY, M. PAGET, and C. VAILLE (Bull. Soc. Chim. biol., 1937, 19, 800—804).—A standard technique for the determination of blood-Cl' based on previously described methods is recommended. A. L.

**Blood chemistry of surviving parathyroid-ectomised dogs.** E. I. EVANS, S. SZUREK, and R. KERN (Endocrinol., 1937, 21, 374—379).—After parathyroidectomy, serum-Ca and -inorg. P can remain at tetany levels for 9 months. Changes in Na, K, Mg, and Cl' are not significant. P. G. M.

**Total osmotic concentrations in serum and aqueous humour.** G. H. BENHAM, H. DAVSON, and W. S. DUKE-ELDER (J. Physiol., 1937, 89, 61—63).—The mol. concn. of the serum of the cat is > that of the aq. humour. The mean mol. difference corresponds to a difference in osmotic pressure of 31—39 mm. of Hg. R. N. C.

**Anti-fluorescent action of human serum on some fluorescein salts.** F. ZUCKERANDL (Compt. rend. Soc. Biol., 1937, 125, 804—806).—The anti-fluorescent power of normal serum is the same for the Na, K, Ca, or Mg salts of fluorescein. In cirrhosis and cancer there is no action on the Ca and Mg and on the Na and K salts, respectively. H. G. R.

**Reversible neutralisation of the anthracidal power of serum by Congo-red.** J. GORDON and N. WOOD (J. Hyg., 1937, 37, 471—473).—Fresh Congo-red solution added to rabbit serum inactivates the anthracidal power. Adsorption of the dye on charcoal also removes the power from serum but such serum when added to serum inactivated with Congo-red regains its activity. W. L. D.

**Hæmolytograph.** M. VILLARET, L. JUSTIN-BESANÇON, and R. EVEN (Compt. rend. Soc. Biol., 1937, 125, 871—872).—An apparatus to measure the kinetics of hæmolysis *in vitro* is described. H. G. R.

**"Kinelysis."** M. VILLARET, H. BÉNARD, L. JUSTIN-BESANÇON, and A. ABADI (Compt. rend. Soc. Biol., 1937, 125, 872—874).—The rate of hæmolysis *in vitro* ("kinelysis") is approx. 75 sec. for a 20% suspension of normal cells and may be considerably increased in pathological conditions. H. G. R.

**Hæmolytic "erythrodiagnosis."** M. VILLARET, H. BÉNARD, L. JUSTIN-BESANÇON, and A. ABADI (Compt. rend. Soc. Biol., 1937, 125, 875—876).—The discharge of electrolytes from the corpuscular protoplasm in isotonic solution under the action of hæmolysing substances ("erythrodiagnosis") is less for pathological than for normal erythrocytes. H. G. R.

**Use of polymerised anetholedisulphonate as an anticoagulant in the determination of the alkaline reserve of blood-plasma.** H. HIGOUNET (Bull. Soc. Chim. biol., 1937, 19, 843—845).—No special precautions are necessary to avoid loss of  $CO_2$  through contact with the air. A. L.

**Relationship between alexin and the anti-complementary power of serum.** L. NATTAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt.

rend. Soc. Biol., 1937, **125**, 850—853).—The development of anticomplementary power and the disappearance of alexin are not related. H. G. R.

**Mode of action of *Bothrops atrox* venom on blood coagulation *in vitro*.** C. J. HANUT (Arch. internat. Physiol., 1937, **44**, 329—350).—Oxalated plasma or fibrinogen solutions, free from proserozyme and cytozyme, are coagulated by venom of *B. atrox*. The action is augmented by proserozyme, serozyme, cytozyme, and  $\text{Ca}^{++}$ . H. G. R.

**Antitoxic properties of glutathione. Tetanus toxin.** L. BINET, C. JAULMES, and G. WELLER (Compt. rend., 1937, **204**, 1761—1763).—Glutathione (I) (20 mg.) alone or with <5 mg. or >20 mg. of  $\text{NaHCO}_3$  does not protect guinea-pigs against tetanus toxin, but with 5—20 mg. of  $\text{NaHCO}_3$  affords complete protection. J. L. D.

**Toxins of dysentery bacilli. Antitoxic protective power of sera obtained after injection of endotoxin-antigen-O of Shiga's and Flexner's bacilli.** A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, **125**, 796—799).—Antibody-O, formed after injection of endotoxin-antigen-O, is sp. H. G. R.

**Existence of a thermolabile and neurotoxic toxin (exotoxin) in the Shiga bacilli.** A. BOIVIN and L. MESROBEANU (Compt. rend., 1937, **204**, 1759—1761; cf. this vol., 183, 197).—Dead cultures of the *S* form of Shiga's bacillus heated to 55° are 10 times as toxic to mice as those heated to 100°. The *S* form of Shiga's bacillus and the *R* and *S* forms of Flexner's bacillus have not similar properties.  $\text{CCl}_3\cdot\text{CO}_2\text{H}$  ppt. the toxin from autolysed suspensions of Shiga's bacillus. The toxic properties are abolished in 0.5 hr. at 100° and by digestion with trypsin. J. L. D.

**Glutathione as an antitoxin for diphtheria and tetanus toxins.** H. VINCENT (Compt. rend., 1937, **204**, 1693—1694).—Glutathione detoxicates diphtheria toxin at  $p_{\text{H}}$  7.2—7.4 and at 38—39° in 2—4 days. The detoxication is less apparent with tetanus toxin. J. L. D.

**Adsorption of antigens by antibodies or *vice versa*. III. Effect of electrolytes on the rate of flocculation of toxin-antitoxin mixtures of diphtheria and tetanus.** B. N. GHOSH and N. N. RAY (Indian J. Med. Res., 1937, **24**, 625—631).—The flocculating power of Na citrate (I),  $\text{Na}_2\text{HPO}_4$ ,  $\text{Na}_2\text{C}_2\text{O}_4$ , and NaCl on diphtheria toxin-antitoxin mixtures decreased in the order named; urea and glucose do not cause flocculation. Purified and conc. diphtheria antitoxin flocculates with its toxin (II) in presence of (I) or  $\text{Na}_2\text{HPO}_4$ , the rate of flocculation depending on the concn. of the electrolytes and the potency of (II). Tetanus antitoxin also flocculates with its toxin in presence of (I), the balanced mixture flocculating most rapidly. R. N. C.

**Antitetanus antibodies in normal horse serum.** P. CONDREA, H. POENARU, and G. DIMA (Compt. rend. Soc. Biol., 1937, **125**, 768—770). H. G. R.

**Factors affecting the tuberculin test.** W. E. NELSON, F. B. SEIBERT, and E. R. LONG (J. Amer.

Med. Assoc., 1937, **108**, 2179—2181).—Tuberculin is heat-stable and may be adsorbed on glass and rubber, thus giving misleading results unless care is taken in cleaning apparatus used. H. G. R.

**Fixation of the complement reaction and blood-antihormones.** R. DEMANCHE, G. LAROCHE, and H. SIMONNET (Compt. rend. Soc. Biol., 1937, **125**, 718—719).—Negative results in this reaction are not due to a low hæmolytic power of the serum. H. G. R.

**Immunology of pepsin and pepsinogen.** C. V. SEASTONE and R. M. HERRIOTT (J. Gen. Physiol., 1937, **20**, 797—806).—Pepsin (I) antisera from pigs react with alkali-denatured (I) from pigs, oxen, and guinea-pigs but not from rabbits, chickens, and sharks. (I) antisera react with (I) and pepsinogen (II), but (II) antisera react with (II) and not with (I). Neither (I) nor (II) antisera react with the serum-proteins from the same species, nor do serum-protein precipitins with the homologous (I) or (II). After activation of (II), a substance reacting with (II) antiserum persists; this is probably serologically distinct from (I) or (II). E. M. W.

**Antigenic behaviour of serum-proteins with special reference to crystalalbumin and seroglycoid.** L. F. HEWITT (Biochem. J., 1937, **31**, 1047—1052).—The antigenic function of serum-albumin is due mainly to seroglycoid (cf. this vol., 164) and to traces of pseudoglobulin. Crystalalbumin, which constitutes the bulk of the albumin fraction, is only very feebly antigenic. In blood-serum there are at least five sp. antigens, viz., euglobulin, pseudoglobulin, crystalalbumin, seroglycoid, and probably mucoid. These differ in antigenic potency. P. W. C.

**Effect of combination with diazo-compounds on the immunological reactivity of antibodies.** H. EAGLE, D. E. SMITH, and P. VICKERS (J. Bact., 1936, **31**, 65—66).—Gradual destruction of reactivity of antisera by coupling with diazo-compounds is due to progressive decrease in activity of all the antibody mols. and not to inactivation of an increasing proportion of the mols. Flocculating activity of diphtheria antitoxin was thus destroyed before an appreciable decrease in protective titre, *in vivo*, was apparent. Protein groups reacting with diazo-compounds probably include aliphatic  $\text{NH}_2$ ,  $\text{NH}$  of histidine, tryptophan, proline, and hydroxyproline, and the OH of tyrosine. A. G. P.

**Immunological properties of an artificial carbohydrate-protein antigen containing glycuronic acid.** W. F. GOEBEL (J. Bact., 1936, **31**, 66).—A compound of the diazonium salt of *p*-aminobenzyl- $\beta$ -glycoside of glycuronic acid (I) with foreign protein reacted with antipneumococcus horse sera types III and VIII. The corresponding compound containing glucose was inert. (I) is a common constituent of the sp. polysaccharide (II) of pneumococcus types III and VIII. Immunological cross reactions exhibited by the bacilli probably depend on the configuration of the uronic acid constituent of (II). The mechanism of this reaction and that with the artificial antigen are discussed. A. G. P.

**Conjugation of sodium chloride with serum-proteins as indicated by interference-refractometry and its relation with the albumin : globulin ratio.** N. FIESSINGER, J. ZUCKERANDL, and DE WODZINSKA (Compt. rend. Soc. Biol., 1937, 125, 801—803).—An indirect relation was observed between  $n$  and the albumin : globulin ratio, except in some pathological cases due to disturbances in NaCl metabolism. H. G. R.

**Serological behaviour of metal-protein complexes from agglutinating sera.** H. DIACONO and R. DURAND (Compt. rend. Soc. Biol., 1937, 125, 828—831).—Agglutinins are not affected by treating the serum with  $\text{CuSO}_4$  or  $\text{HgCl}_2$  and may be recovered by dissolving the coagulum in aq.  $\text{Na}_2\text{S}_2\text{O}_3$  or  $\text{MgS}_2\text{O}_3$ . H. G. R.

**Preservation of hæmolytic antibodies in mercury-protein complexes obtained from guinea-pig's anti-sheep sera.** H. DIACONO (Compt. rend. Soc. Biol., 1937, 125, 831—832).—A loss of 50% after 20 days and 100% after 2 months was observed. H. G. R.

**Stabilisation of antitoxic proteins of serum with amides and denaturation with keten.** H. GOLDIE (Compt. rend. Soc. Biol., 1937, 125, 861—863).—Treatment with 10—20% aq. urea or  $\text{NH}_2\text{Ac}$  renders the protein incoagulable and stable to heat, the process being reversible if the reagent is removed by dialysis. The proteins are denatured by treatment with keten and the anaphylactogenic power of the serum is decreased. H. G. R.

**Effect of arsenobenzenes on diphtheria toxin.** H. GOLDIE (Compt. rend. Soc. Biol., 1937, 125, 863—866).—The toxins are rapidly inactivated by small amounts (0.5—1%) of arsenobenzenes, the process being reversed by dialysis. H. G. R.

**Liberation of histamine-like substance in allergic reactions caused by arsenobenzene in the guinea-pig.** A. SIMON and A. M. STAUB (Compt. rend. Soc. Biol., 1937, 125, 815—818). H. G. R.

**Sterols, bile acids, and related natural compounds.** K. BRUNNER (Pharm. Zentr., 1937, 78, 421—431, 439—442).—A survey of present chemical and biological knowledge of the sterols, vitamin-D, bile acids, sexual hormones, cardiac glucosides, and saponins. E. H. S.

**Ultimate composition of biological material.** I. Aims, scope, and methods. D. A. WEBB and W. R. FEARON. II. Spectrographic analyses of marine invertebrates, and the chemical composition of their environment. D. A. WEBB (Sci. Proc. Roy. Dublin Soc., 1937, 21, 487—504, 505—539).—I. A new source of error due to the effect of tissue salts in unmasking "latent" impurities in the graphite electrodes is reported. The activity of the organism as a geological agent is illustrated by analyses of peat ash at different depths, and biological discrimination between different elements is illustrated by analyses of seed ash and the ash of baker's and of brewer's yeast.

II. Analyses of a no. of animal and plant tissues and data for 25 elements are reported, with special

reference to distribution and abundance, and to the limits of sensitivity of the method for each element.

N. M. B.

**Fat of the white mouse (*Mus musculus albinus*).** J. PRITZKER and R. JUNGKUNZ (Pharm. Acta Helv., 1937, 12, No. 1, 2 pp.).—Fat (15% of body-wt.) extracted from the viscera of one old female tame mouse was liquid at room temp. and had  $n_{40}^{20}$  1.4408, acid val. 13.4, sap. val. 221.4, I val. (Hanus) 60.3, Reichert-Meissl val. 5.72, Polenske val. 1.1, unsaponifiable matter (Spitz-Honig) 0.31%. The insol. fatty acids had  $n_{40}^{20}$  1.4624, mean mol wt. 271.5, and contained 15% of solid (saturated) acids. The I val. of the liquid acids was 90.7. E. L.

**Nitrogenous extractives of scallop muscle.** I. Isolation and structure of octopine. II. Constituents of the muscle. E. MOORE and D. W. WILSON (J. Biol. Chem., 1937, 119, 573—584, 585—588; cf. this vol., 295).—I. 6 kg. of the muscle of *Pecten magellanicus* yield approx. 19 g. of octopine (I), m.p. 261—264° (corr.),  $[\alpha]_D^{25} + 19.6^\circ$  in  $\text{H}_2\text{O}$  [picrate, m.p. 226—230° (corr., decomp.); picrolonate, m.p. 237—239° (corr., decomp.)]. (I) with aq.  $\text{Ba}(\text{OH})_2$  gives urea and an  $\text{NH}_2$ -compound,  $\text{C}_8\text{H}_{16}\text{O}_4\text{N}_2$ , m.p. 256—257° (corr., decomp.).

II. The fresh muscle contains phosphoarginine and yields arginine together with (I). W. McC.

**Cholesterol content of the nails of animals.** K. HOTTA and K. TAKAGI (J. Biochem. Japan, 1937, 25, 109—111).—Tabulated data for various animals range from 0.078 (canary) to 0.483% (rabbit). In man, the content averages 0.362%. F. O. H.

**Cryogenic method of preparing hydrosols of sterols and phospholipins.** I. A. REMEZOV and M. I. KARLINA (Biochimia, 1937, 2, 537—542).—The material (sterol, lecithin) is ground to an impalpable powder with liquid  $\text{N}_2$ , and the powder is shaken with  $\text{H}_2\text{O}$ , to yield stable sols. R. T.

**Influence of external conditions and of the physiological state of animals on cerebral phosphorus compounds.** N. V. BOLDIREVA (Biochimia, 1937, 2, 543—548).—The total P content of frog brain is const. throughout the year, but its distribution varies, inorg., phosphagen-, and lipin-P rising, and protein-P falling, from winter to autumn. Analogous effects are obtained when hibernating frogs are placed in a warm environment during the winter. The total P content of foetal rabbit brain rises gradually to a max. at birth, thereafter falling; inorg. and phosphagen-P are at a max. 10—11 days after birth, and lipin-P 4 months after birth, at which time protein-P is at a min. R. T.

**Phosphatide content of the brain of hibernating animals in various functional states.** M. I. OKUN (Biochimia, 1937, 2, 580—586).—At birth the brain of marmots contains 0.33% of unsaturated and 0.60% (dry wt.) of saturated phosphatide-P. After the age of 30—45 days these components are present in approx. equal amount. During hibernation the content of saturated phosphatides rises at the expense of unsaturated ones.

R. T.

**Polypeptides and amino-acids in the organism. Characterisation and methods of determination.** A. LESURE (J. Pharm. Chim., 1937, [viii], 25, 23—34, 62—73, 111—128).—A review.

**Glucoproteins. V. Protein complexes of chondroitinsulphuric acid.** K. MEYER, J. W. PALMER, and E. M. SMYTH. **VI. Preparation of chondroitinsulphuric acid.** K. MEYER and E. M. SMYTH (J. Biol. Chem., 1937, 119, 501—506, 507—510).—V. The compounds of chondroitinsulphuric acid (I) with proteins are true salts which have a const. composition over a wide range of concn. of the components.

VI. (I) is extracted from cartilage with aq.  $\text{CaCl}_2$  as the acid Ca salt, and nitrogenous impurities are removed by denaturation with  $\text{CHCl}_3$  and amyl alcohol followed by adsorption on Lloyd's reagent.

P. G. M.

**Content of free amino- and carboxyl groups in certain proteins.** M. S. REZNITSCHENKO (Biochimia, 1937, 2, 559—570).—The no. of  $\text{NH}_2$  groups determined by Linderström-Lang's method is  $>$  that of  $\text{CO}_2\text{H}$  (Willstätter), in the case of certain proteins. The difference is due to  $(\text{NH}_2)_2$ -acids present in the proteins, and it is concluded that terminal  $\alpha\text{-NH}_2$  may be taken as equal in no. to  $\text{CO}_2\text{H}$ . The length of the polypeptide chain is hence derived, and corresponds in the cases of ovalbumin, glutenin, glutelin, and zein to that of a 7-, 8-, 10-, and 11-peptide, respectively.

R. T.

**Individuality of gliadin.** A. G. KUHLMANN (Nature, 1937, 140, 119—120).—Results of experiments on the peptisation of the proteins of gluten by EtOH are summarised. These, and other experiments, show that the gliadin of wheat is not a chemical individual. It represents an adsorption complex of at least two fractions, now named  $\alpha$ - and  $\beta$ -gliadin. In its properties  $\beta$ -gliadin approaches glutenin.  $\beta$ -Gliadin dissolves as a result of interaction by means of adsorption with the more easily peptisable fraction,  $\alpha$ -gliadin, which forms the main mass of Osborne's gliadin.

L. S. T.

**Mechanism of the action of neutral salts on protein.** I. A. SMORODINCEV and S. A. PAVLOV (Bull. Soc. Chim. biol., 1937, 19, 915—921).—The total N contents of the extracts of collagen and gelatin with  $N\text{-NaCl}$ ,  $\text{-KCl}$ ,  $\text{-CaCl}_2$ , and  $\text{-SrCl}_2$  are 2—3 times that of the aq. extracts. The  $\text{NH}_2\text{-N}$  contents of the salt solution extracts are, however,  $<$  that of the aq. extracts, showing that no hydrolysis takes place. The solubility of the protein is affected by the nature of the cation and the anion of the salt. The variation of the ratio of  $\text{NH}_2\text{-N}$  when determined by the methods of Van Slyke and Sorensen may be due to the different enolising power of the salts on the peptide linkings.

A. L.

**Refractive index of hen ovalbumin. I, II.** K. KONDO and H. IWAMAE (J. Agric. Chem. Soc. Japan, 1937, 13, 537—545, 546—553).—I. The  $n$  and  $\eta$  for a definite amount of ovalbumin (I) in solution vary linearly with concn.  $n$ ,  $\eta$ , and  $d$  for a definite amount of (I) in a solution of  $(\text{NH}_4)_2\text{SO}_4$  vary with concn. of the latter.

II.  $n$  and  $d$  of aq. solutions of (I) vary with  $p_H$  and increase to a max. at the isoelectric point. On the acid and alkaline side of the latter they decrease suddenly, and then increase again.  $\eta$  varies inversely as  $n$ . Explanations are offered for these phenomena.

J. N. A.

**Isoionic reaction of hen ovalbumin.** K. KONDO and H. IWAMAE (J. Agric. Chem. Soc. Japan, 1937, 13, 554—557).—Ovalbumin (I) and its  $(\text{NH}_4)_2\text{SO}_4$  complex both combine with  $\text{H}_2\text{SO}_4$  and with  $\text{NH}_3$ . The isoionic reaction of (I) is dependent on  $(\text{NH}_4)_2\text{SO}_4$ , and if the effects of salts and (I) itself are zero the reaction of (I) is  $p_H 4.89 \pm 0.02$ .

J. N. A.

**Silk fibroin. VI. Relative viscosity of fibroin and its component solution.** H. KANEKO and Y. NAKAZAWA (J. Agric. Chem. Soc. Japan, 1937, 13, 595—600; cf. B., 1937, 532).—The high  $\eta$  of solutions of silk fibroin (I) in conc.  $\text{H}_2\text{SO}_4$  is due mainly to the special structure of the (I) micelle; this structure is gradually destroyed on keeping the solution, by rise of temp., or by addition of  $\text{H}_2\text{O}$ . The (I) component sols under similar conditions show low  $\eta$ .

J. N. A.

**Total sulphur in normal human keratinous tissues.** P. VALDIGUIÉ and DACHARY (Compt. rend. Soc. Biol., 1937, 125, 855—857).—The average vals. for total S in the hair and nails are 4.86 and 3.37%, respectively. Variations with colour, age, and sex are discussed.

H. G. R.

**Carotenoids of the chicken retina.** G. WALD and H. ZUSSMAN (Nature, 1937, 140, 197).—Three pigments, a purplish-red (astacene), a golden or orange xanthophyll, and a yellow or yellowish-green hydrocarbon, have been cryst. from retinal extracts; they are carotenoids, and in suitable solvents closely reproduce the colours of the retinal droplets in the cones. Astacene and the hydrocarbon pigment appear to be synthesised by the chicken. Spectral extinction curves are reproduced.

L. S. T.

**Visual purple system in fresh-water fishes.** G. WALD (Nature, 1937, 139, 1017—1018).—The behaviour of porphyropsin (I), a dark purple pigment extracted from the retina of fresh- $\text{H}_2\text{O}$  fishes, on exposure to light has been investigated by following the absorption of light of (I) solutions under different conditions. Under the influence of light, (I) in the retina of the fish undergoes a cycle of changes similar to that taking place with rhodopsin, the corresponding visual purple pigment in mammals, birds, and certain marine fishes. The components of the two systems are quite different.

L. S. T.

**Absorption spectra of visual purple and of indicator-yellow.** R. J. LYTGOE (J. Physiol., 1937, 89, 331—358).—The absorption spectrum of visual purple (I) is unaffected by  $p_H$ ; the max. band is at 502 m $\mu$ . (I) is bleached by light outside the  $p_H$  range 5.2—10.0 to an intermediate substance, "transient orange," which then thermally decomposes to indicator-yellow (II), the alkaline form of which has a narrow band with a max. probably in the near ultraviolet, and the acid form a broad band with a max. at 430—440 m $\mu$ . Below  $p_H 6.1$  the absorption curves of (II) are different from those at neutrality, apparently

owing to tautomeric change; the thermostability disappears between 4.0 and 5.2. The reactions of (II) are completely reversible. (I) is slightly regenerated from bleached solutions between  $p_H$  7.0 and 9.3. R. N. C.

**Accessory photo-sensitive substance in visual purple regeneration.** A. M. CHASE (Science, 1937, 85, 484).—Visual purple (I) solutions bleached by violet and blue light show more regeneration than those bleached by green, yellow, and orange light. This suggests the existence of a blue-sensitive substance the decomp. of which is essential for regeneration of (I). L. S. T.

**Diffusion coefficient and molecular size of visual purple.** S. HECHT, A. M. CHASE, and S. SHLAER (Science, 1937, 85, 567—568).—The diffusion coeff., determined by the method of Northrop and Anson, gives a probable val. of 0.0190 sq. cm. per day. The calc. radius of the mol. of visual purple (I) is then  $6.26 \times 10^{-7}$  cm., and the mol. vol. 623,000 and mol. wt. 810,000. (I) thus belongs to the carotenoid proteins. L. S. T.

**Distribution and nature of the flavin contained in the skin of the eel.** M. FONTAINE and R. G. BUSNEL (Compt. rend., 1937, 204, 1591—1593; cf. this vol., 296).—Frozen or  $\text{CH}_2\text{O}$ -fixed sections show little green fluorescence and hence contain only traces of free flavin (I). Prolonged immersion in MeOH at 37° liberates (I) from a colloidal complex (probably Warburg's yellow enzyme). J. L. D.

**Wing pigments of common white butterflies.**—See A., II, 392.

**Constitution of ch'an su (senso).**—See A., II, 347.

**Toad poisons. VII. Constituents of ch'an su and the constitution of cinobufagin and cinobufotalin.** M. KOTAKE and K. KUWADA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, 32, 79—82).—A  $\text{CHCl}_3$  solution of an EtOH extract of ch'an su after treatment with  $\text{Al}_2\text{O}_3$  (cf. Wieland *et al.*, A., 1936, 1252) gives cinobufagin, cinobufotalin, and  $\gamma$ -bufotalin. The structures of these substances are discussed in the light of previous work. J. L. D.

**Bee poison. IV. Isolation of both components of the poison by dialysis.** G. HAHN and H. LEDITSCHKE (Ber., 1937, 70, [B], 1637—1644; cf. this vol., 200).—Both components are dialysable but at so widely differing rates that the isolation of both in a homogeneous state is possible. Component II is a basic substance which can be pptd. from aq. solution by alkali. It originates from the gland with the acid secretion. Component I is a (probably amphoteric) acid sol. in alkali, being formed from the gland with the alkaline secretion. Component II does not appear completely stable when heated with acids. The cramp-inducing properties of component I are weakened when it is heated in neutral solution. H. W.

**Biochemistry of milk secretion.** H. D. KAY (J. Soc. Arts, 1937, 85, 841—857).—A lecture.

**Rapid determination of lactoflavin in milk.** C. H. WHITNAH, B. L. KUNERTH, and M. M. KRAMER

(J. Amer. Chem. Soc., 1937, 52, 1153—1154).—10 ml. of milk, treated with 15 ml. of 10%  $\text{CCl}_3 \cdot \text{CO}_2\text{H}$ , are centrifuged for 30—60 min. at 2000 r.c.f., neutralised to Me-orange, diluted to  $0.12\text{—}0.006 \times 10^{-6}$  g. of flavin per ml., and matched fluorometrically against standard solutions. Results are consistent among themselves and agree with biological tests (within 25%). R. S. C.

**Fructose content of spinal fluid.** R. S. HUBBARD and N. M. RUSSELL (J. Biol. Chem., 1937, 119, 647—661).—The fructose (I) content of (pathological) cerebrospinal fluid, determined by Roe's method (A., 1934, 1379), is > that of blood taken at the same time and parallel with the total sugar content of the fluid. The probable formation of (I) from glucose is discussed. F. O. H.

**Human parotid saliva.** M. A. BASIR and T. S. RAMABHADRAN (Indian J. Med. Res., 1937, 24, 911—916).—The saccharogenic power of parotid saliva is 6—8 times that of mixed saliva, although the physical properties of the two are alike. Hydrolysis is of the same order for sol. and amyllum starch. The cardiac depressor substance in saliva is not acetylcholine. R. N. C.

**Cholesterolytic power of bile.** E. CHABROL, J. COTTET, and M. CACHIN (Compt. rend. Soc. Biol., 1937, 125, 726—728).—The technique is not affected by various external factors and a min. concn. of cholalic acid of 1% is necessary. H. G. R.

**Is the cholesterolytic power of bile a function of its cholalic acid content?** E. CHABROL, J. COTTET, and M. CACHIN (Compt. rend. Soc. Biol., 1937, 125, 728—730).—The cholesterolytic power is not solely dependent on the cholalic acid content of the bile. H. G. R.

**Calcium in the hepatic and vesicular bile of the dog.** J. CHEYMOL and A. QUINQUAUD (Compt. rend. Soc. Biol., 1937, 125, 691—692).—Ca in the total solid matter of vesicular bile is 4.5 times that of hepatic. H. G. R.

**Synthesis of sodium taurocholate and taurodeoxycholate.**—See A., II, 342.

**Effect of complete and partial hypophysectomy in adult albino rats on water, chloride, sodium, potassium, and sulphur metabolism.** M. SANDBERG, D. PERLA, and O. M. HOLLY (Endocrinol., 1937, 21, 346—351).—Polydipsia and polyuria occurring in hypophysectomised male rats are > those occurring in female rats. Urinary excretion of  $\text{Cl}^-$ , Na, and K and total and neutral S rises after hypophysectomy, but is little changed after partial hypophysectomy. Faecal S excretion is unchanged in either case. P. G. M.

**Isolation of the natural urine porphyrins.** H. FINK (Ber., 1937, 70, [B], 1477—1482).—The presence of coproporphyrin I in normal urine is identified by the  $p_H$ -fluorescence curve and confirmed by its isolation by a process of adsorptive filtration. H. W.

**Living animal cases of congenital porphyrinuria.** P. J. FOURIE and C. RIMINGTON (Nature, 1937, 140, 68).—The two most severe cases of five

cows affected each excrete 0.6 g. of coproporphyrin and 0.06—0.07 g. of uroporphyrin daily. They show signs of photosensitisation. L. S. T.

**Porphyryns of the I and III series in congenital porphyria.** C. RIMINGTON (Nature, 1937, 140, 105—106).—Porphyryns similar to those found by Fischer *et al.* (A., 1926, 196) in a human porphyria have been isolated from a bovine suffering from congenital porphyria, and, in addition, coproporphyrin and uroporphyrin have been obtained from other tissues. The m.p. of the esters and chromatographic analysis indicate that small quantities of the series III pigments accompany those of series I excreted by congenital porphyria. L. S. T.

**Coal content of anthracotic lungs.** E. MULLER (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 316—318).—The minced and dried material is extracted with Et<sub>2</sub>O and EtOH and digested with HCl. The residue is heated to approx. const. wt. at 160—180° and is then analysed for ash and C. M. A. B.

**Polarographic investigations in serological cancer diagnosis.** R. BRDIČKA (Nature, 1937, 139, 1020—1021).—When the sera are treated with alkali hydroxide, the height of the characteristic protein "wave" (cf. this vol., 205) increases in the carcinomatous serum < in normal serum. Denaturation with 0.05N-HCl produces a similar effect. Peptic cleavage of native and coagulated proteins shows an increase of the protein polarographic wave, and this increase is also smaller in carcinomatous cases. Acute inflammation and fever may also give a reaction similar to that of cancer. The polarographic effect of proteins is ascribed to the -S-S- groups. L. S. T.

**Carcinoma of the islets of Langerhans with hypoglycæmia and hyperinsulinism.** R. W. CRAIG, M. H. POWER, and M. C. LINDEM (Arch. Int. Med., 1937, 60, 88—99).—A report of a case in which metastatic carcinoma of the islets did not interfere with their insulin-producing function. R. M. M. O.

**Refractive index of cancerous sera.** R. JONNARD (Bull. Soc. Chim. biol., 1937, 19, 893—897).—The effect of 0.1 mg. of NaCl and KCl per c.c. on  $n_D$  of 14 sera is recorded. A. L.

**Relation of vitamin-D to dental caries.** F. W. BRODERICK (Brit. Dental J., 1937, 62, 17—27).—Theoretical. An attempt to explain the effects of vitamins and hormones by their physico-chemical action on body-colloids. J. N. A.

**Vitamins in dental diseases.** R. JEANNERET (Z. Vitaminforsch., 1937, 6, 250—264).—A review.

**Phloridzin diabetes, phloridzin and related substances.** I. Properties and colour reactions of phloridzin. II. Fate of phloridzin injected intravenously into the dog. III. Relation between molecular structure and diabetogenic action. IV. Mechanism of phloridzin glycosuria. A. LAMBRECHTS (Arch. internat. Physiol., 1937, 44, Suppl. 1—39, 40—91, 92—135, 136—162).—I. The colour reactions of phloridzin (I) are reviewed and restudied. The ultra-violet spectrum depends

on  $p_H$  in a manner indicating a keto-enol transformation, and is compared with the spectra of phloretin, phlorin, and phloroglucinol. Spectrographic determination of these substances is described.

II. Injected (I) disappears at first rapidly and then more slowly, so that (I) is present in the blood throughout the period of glycosuria. It occurs mainly in the plasma, adsorbed on the proteins, with which it is pptd. by reagents, and from which it cannot be separated by ultrafiltration or extraction, except by combined pptn. and elution with excess of EtOH. (I) is fixed in all tissues and disappears at varying rates, most rapidly in muscle, in which its presence can never be demonstrated; yet muscle destroys it rapidly *in vitro* by a process which is apparently not enzymic. Small amounts of (I) pass into the urine.

III. The diabetogenic action depends on the presence in the mol. of a phenolic OH in association with a glucosidic O and is possessed by many diversely substituted derivatives and other phenolic glucosides. It is usually associated with a polyuria-stimulation. The two responses are quantitatively independent of each other.

IV. (I) raises the renal threshold for PO<sub>4</sub>''' and also prevents resorption by the kidney tubules of several substances, *e.g.*, dyes, besides glucose. Colour reactions show it to be localised in the upper part of the renal tubule. In general it does not affect phosphatase action *in vivo*, nor does it inhibit *in vitro* calcification of the kidney. Its action on renal phosphatase *in vitro* is due partly to a direct inhibition, and partly to a displacement of  $p_H$ . Other glycosuria-provoking substances examined inhibit the enzyme irregularly in relation to their physiological action and several phenolic substances with no physiological action have a marked effect on the enzyme *in vitro*. Lundsgaard's hypothesis relating (I) glycosuria specifically to an interference with carbohydrate metabolism is rejected. R. M. M. O.

**Carbon monoxide goitre.** E. W. BAADER (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 227—234).

M. A. B.

**p-Aminobenzenesulphonamide in treatment of *Bacterium coli* infections of the urinary tract.** M. KENNY, F. D. JOHNSTON, and T. VON HAEBLER [with A. A. MILES] (Lancet, 1937, 233, 119—125).—Small oral doses of  $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  (I) effect the rapid disappearance of *B. coli* and pus cells, and remission of symptoms, in women with infections of the urinary tract. Toxic effects, such as sulphæmoglobinæmia, methæmoglobinæmia, and headache, sometimes appear. Oral administration of (I) renders urine bactericidal to certain members of the *B. coli* group. The bactericidal power approx.  $\propto$  the (I) content. L. S. T.

**Vitamin-C and infection; excretion of vitamin-C in osteomyelitis.** M. A. ABBASY, L. J. HARRIS, and N. G. HILL (Lancet, 1937, 233, 177—180).—Osteomyelitis causes a diminished rate of excretion of vitamin-C in the urine and a lowered response to test dose, apparently indicating an increased use of -C during the infective process.

L. S. T.

**Vitamin-C and infection ; excretion of vitamin-C in pulmonary tuberculosis and in rheumatoid arthritis.** M. A. ABBASY, L. J. HARRIS, and P. ELLMAN (Lancet, 1937, 233, 181—183; cf. preceding abstract).—In pulmonary tuberculosis, the deficit in vitamin-C, shown by a lowered urinary excretion of -C and a smaller response to test doses, is considerable. The severity of the infection, the blood sedimentation rate, and the diminution in the urinary -C are correlated. In rheumatoid arthritis, there is also a lowered excretion of -C, and low excretions are associated with high blood sedimentation rates.

L. S. T.

**Vitamin-C and infection ; influence of infection on the vitamin-C content of the tissues of animals.** L. J. HARRIS, R. PASSMORE, and W. PAGEL (Lancet, 1937, 233, 183—186; cf. preceding abstracts).—Guinea-pigs suffering from an acute infection with *Bacterium aertrycke* or *Pasteurella pseudotuberculosis* or from the effects of a diphtheria toxin showed a marked diminution in the vitamin-C content of the adrenal glands but not of the liver. In a more chronic infection with *Mycobacterium tuberculosis*, the -C content of the liver is also diminished.

L. S. T.

**Uranium nephrosis.** A. T. MILHORAT and H. J. DEUEL, jun. (Arch. Int. Med., 1937, 60, 77—87).—Glycosuria appears together with albuminuria and increased excretion of  $H_2O$  and  $Cl^-$  shortly after the administration. The glycosuria gradually disappears but the other symptoms persist until complete anuria sets in. Progressive decrease in total N excretion is followed by related increase in non-protein-N content of the blood, which, together with blood-sugar, increases sharply at the onset of anuria.

R. M. M. O.

**Blood-sugar of animals affected with rabies.** P. REMLINGER and J. BAILLY (Compt. rend. Soc. Biol., 1937, 125, 708—711).—An increase in blood-sugar with occasional glycosuria was observed.

H. G. R.

**Bone analysis in diagnosis of bone diseases of animals.** J. MAREK, O. WELLMANN, and L. URBÁNYI (Mezog. Kutat., 1937, 10, 149—158).—Although a mere determination of ash content is of no diagnostic val., the Ca : P and CaO : MgO ratios give immediate information not only of the presence of rickets but also of its cause, whether alkalotic or acidotic.

E. C. S.

**Phosphorus and calcium deficiency diseases as two ætiologically distinct entities.** P. J. DU TOIT and A. I. MALAN (Nature, 1937, 140, 153—154).—Experimental rickets produced in cattle, goats, sheep, pigs, and horses (indications) prove that insufficient dietary P is the causal factor in the production of rickets under conditions of vitamin-D sufficiency. Insufficient Ca in the diet produces not rachitic lesions but a different bone disease, viz., osteofibrosis. Osteoporosis is invariably associated with both diseases.

L. S. T.

**Mineralogic study of silicosis.**—See A., I, 484.

**Variations in serum-lipins and in the ratio of the total lipins to cholesterol in ictero-hæmorrhagic spirochaetosis.** P. NICAUD, M. LAUDAT, and J. GERBAUX (Compt. rend. Soc. Biol., 1937, 125, 799—801).—An increase in the ratio occurs.

H. G. R.

**Polypeptidæmia in cases of gastro-duodenal ulcers.** S. MARINO and A. SALADINO (Arch. Farm. sperim., 1937, 63, 161—182).—The disease is associated with levels of blood-polypeptides > normal.

F. O. H.

**Interpretation of the disturbances in carbohydrate metabolism during acute experimental uræmia in rabbits.** M. VILLARET, L. JUSTIN-BESANÇON, A. RUBENS-DUVAL, and P. BARBIER (Compt. rend. Soc. Biol., 1937, 125, 736—738).—A decrease in liver-glycogen is accompanied by an increase in free and protein-bound sugar.

H. G. R.

**Value of glucose in human health and sickness.** O. MUHLBOCK (Z. Spiritusind., 1937, 60, 213).—A review, including an account of the use of glucose in the treatment of wounds.

I. A. P.

**Impedance changes in muscle during contraction, and their possible relation to chemical processes.** M. DUBUISSON (J. Physiol., 1937, 89, 132—152).

R. N. C.

**Function of the gills of the mayfly nymph, *Clocon dipterum*.** C. A. WINGFIELD (Nature, 1937, 140, 27).—The  $O_2$  consumptions of normal and gill-less nymphs at different  $[O_2]$  have been compared. At high  $[O_2]$  the gills appear to play little or no part in respiration and aid  $O_2$  consumption only when the  $O_2$  content of the  $H_2O$  is low (<3 c.c. per litre).

L. S. T.

**Fasting metabolism of various breeds of hog. III. Metabolism and surface area.** T. DEIGHTON (J. Agric. Sci., 1937, 27, 317—331; cf. A., 1934, 683).—Metabolism in a state of inanition is a function of the power of the wt. rather than of the true surface area of the animal. Hogs born in the summer and autumn of one year exhibit two periods of max. metabolism, one immediately and one in the following summer. This is possibly due to the effect of light on thyroid activity produced by the intermediate action of the anterior pituitary. The view that nett energy is a statistical rather than a physiological const. receives further support.

A. G. P.

**Nutritive value of raw and pasteurised milk for mice.** G. S. WILSON and I. MAIER (J. Dairy Res., 1937, 8, 203—217).—Mice were fed on a biscuit diet supplemented by minerals (Fe, Cu, and Mn), yeastrel, and raw and pasteurised milks. No difference in growth, prolificacy, or successful rearing of litters was observed between the two groups, but the average wt. of young at weaning from does thus fed was significantly greater in the raw than in the pasteurised group. In breeding experiments, raw milk was significantly superior in regard to wt. of mice and the wt. of the young at weaning but the breeding performances were similar. On comparing the feeding of milk in an inverted tube as against an open vessel, the pasteurised group gave better, but not significant, wt. increases. The difference is ascribed to the different fat intakes under the two methods of feeding.

Second and third generations of milk-biscuit diets showed no deterioration in growth rate or fecundity.

W. L. D.

**Resistance to infection with *Bact. typhimurium* of mice fed on raw and pasteurised milk.** G. S. WILSON (J. Dairy Res., 1937, 8, 218—223).—Two groups of mice (500 in each) fed on a supplemented biscuit, with raw or pasteurised milk, diet were inoculated intraperitoneally and another two groups were fed orally with the organism. The nos. which died from sp. infection were: raw 51.8%, pasteurised 51.2% (inoculation), and raw 38.1, pasteurised 44.4% (feeding). The nos. which contracted infection were respectively 95.3, 91.6; 67.5, 66.0. The resistance to infection on both milk types was similar.

W. L. D.

**Influence of diet on resistance to infection.** I. Effect of various diets on fertility, growth, and survival of mice. II. Effect on resistance of mice to bacterial infection. M. WATSON (J. Hyg., 1937, 37, 396—419, 420—444).—I. A diet of oats, milk, and H<sub>2</sub>O grossly deficient for mice is more satisfactory on addition of bran, cod-liver oil, and Yeastrel. No improvement is obtained on adding an acid salt mixture but some on adding a alkaline salt mixture. Raising the protein and adding dried separated milk are further improvements. Gluten and casein fed to young mice in a mixed diet appear to be equiv. in val. Synthetic diets reduced fertility. Mice in corroded Zn cages showed a lower fertility than those in glass owing to Pb poisoning. Exclusion of light had no effect on the survival and growth of young mice.

II. Young mice fed on a dried separated milk, oatmeal, dextrin, flour-H<sub>2</sub>O biscuit, coconut and cod-liver oils, Yeastrel, bran, milk, and H<sub>2</sub>O are more resistant to *per os* infection of *Bact. typhimurium* than those on a diet with more oatmeal and dried milk, dextrin, and biscuit but with coconut oil omitted.

W. L. D.

**Balanced diets.** I. S. P. NIYOGI, V. N. PATWARDHAN, and R. G. CHITRE (Indian J. Med. Res., 1937, 24, 787—796).—The animal fat and protein contents of two Indian diets are low compared with a physiologically ideal diet, and they have also a very low lysine content. Effects on growth and reproductive power are examined.

R. N. C.

**Effect of amino-acids on the metabolism of various forms of muscular tissue.** R. CRISMER (Arch. internat. Physiol., 1937, 44, 474—487).—Aliphatic NH<sub>2</sub>-acids increase the frequency and amplitude of contraction of cardiac muscle and the production of lactic acid (I) by the myocardium. Phenylalanine decreases the contractility of rabbit heart and increases production of (I), but has a stimulating effect on the frog heart.

H. G. R.

**Absorption of amino-acids and their distribution in the body-fluids.** C. BOLTON and G. P. WRIGHT (J. Physiol., 1937, 89, 269—286).—Absorption of NH<sub>2</sub>-acids (I) from the cat's intestine follows the diffusion law. In the process of rapid absorption of products of digestion (I) concn. in the efferent veins of the villus is > in the efferent lymph. Van Slyke and Meyer's findings that a large proportion of

(I) are broken down in the liver are confirmed. In the fasting or resting state, the liver continues to remove (I) from the blood passing through it. In starvation the muscular tissues appear to be supplying (I) to the blood.

R. N. C.

**Synthesis of creatinephosphoric acid in muscle and the "reaction-form" of sugar.** O. MEYERHOF (Naturwiss., 1937, 25, 443—446).—With dialysed muscle-extract containing added cozymase, Mg, Mn, inorg. P<sub>2</sub>O<sub>5</sub>, and adenosinetri- and hexosedi-phosphoric acid (I), formation of lactic and phosphoglyceric acid (II) is primarily accelerated by presence of creatine (III). In appropriate fermentative systems, the acceleration of (II) formation from (I) by (III) equals that by glucose, indicating simultaneous formation of creatinephosphoric acid. The general course of carbohydrate transformation during yeast and muscle metabolism is discussed.

F. O. H.

**Metabolism of creatine.** I. Micro-determination of creatine and creatinine. II. Conversion of arginine into creatine in the isolated rabbit heart. R. B. FISHER and A. E. WILHELM (Biochem. J., 1937, 31, 1131—1135, 1136—1156).—I. A colorimetric method for determining 5—80 × 10<sup>-6</sup> g. of creatinine (I) depends on the absorption of (I) from acid solution by fuller's earth and elution with alkaline picrate. The standard error of an individual determination is ±0.98 × 10<sup>-6</sup> g.

II. The isolated male rabbit heart, perfused with a modified Ringer-Locke solution, exhibits no change in total (I) content. When arginine (II) is added to the perfusate, the total (I) of hearts from post-pubertal animals increases to an extent which corresponds almost exactly with the amount of (II) which disappears, this increase in (I) being due solely to increase in creatine. No increase in (I) occurs with pre-pubertal animals.

P. W. C.

**Effect of external temperature on the metabolism of creatinine and creatine.** E. F. TERROINE, A. M. DE LA BERNARDIE, and P. LELU (Compt. rend., 1937, 204, 1757—1759; cf. A., 1923, i, 631).—Decrease in temp. (30° to 5°) lessens the excretion of creatinine (I) of adult rats by 30%. The excretion of creatine (II) is simultaneously increased. (II) (2 mg.) injected into rats kept at 10°, but not at 30°, is recovered in the urine as (I) or (II). Hence metabolism of (II) does not occur at temp. <10°.

J. L. D.

**Metabolism of purine-nitrogen in fish and batrachians.** I. Catabolism in selachians. A. BRUNEL (Bull. Soc. Chim. biol., 1937, 19, 805—826).—The aq. extract of the liver of *Raia clavata*, L., and *R. punctata*, Risso, pptd. with EtOH gives a prep. containing allantoicase, capable of hydrolysing allantoic acid to urea and glyoxylic acid (optimum p<sub>H</sub> 7.0), and allantoinase which is sp. for allantoin (optimum p<sub>H</sub> 7.5—7.6). Urocanic and homoallantoic acids are not attacked, but *N*-methylallantoic acid is hydrolysed by the prep.

A. L.

**Regulators of nitrogenous metabolism.** I. Adrenaline. M. T. BUCHY. II. Thyroxine. E. F. TERROINE and R. BONNET (Arch. internat. Physiol., 1937, 44, 139—173, 265—312).—I. Administration

of adrenaline to rats with a low endogenous metabolism of N causes an increase in protein (I) catabolism and creatinuria, whilst the purine (II) catabolism, the coeff. of oxidation of (I) and (II), and the coeff. of ammonuria are maintained at the same level.

II. Administration of thyroxine to animals (rats or pigs) on a carbohydrate diet frequently increases the sp. endogenous excretion of N but has no oxidising effect on the waste products of (I) or (II) metabolism. A rapid appearance of creatinuria was also observed.

H. G. R.

**Intermediary metabolism of tryptophan.** XXV. Isolation of *d*-kynurenine. Y. KOTAKE, jun., and N. ITO (J. Biochem. Japan, 1937, 25, 71—77; cf. A., 1936, 1544).—The urine of rabbits fed with *dl*- or *l*- but not *d*-tryptophan contains *d*-kynurenine,  $[\alpha]_D^{25} +28.5^\circ$ .

F. O. H.

**Cystinuria.** V. Metabolism of caseinogen and lactalbumin. E. BRAND, R. J. BLOCK, B. KASSELL, and G. F. CAHILL. VI. Metabolism of the hydroxy-analogue of methionine (*dl*- $\alpha$ -hydroxy- $\gamma$ -methylthiobutyric acid). VII. Metabolism of *S*-methylcysteine,  $\gamma$ -thiobutyric acid, and  $\gamma\gamma'$ -dithiodibutyric acid. E. BRAND, R. J. BLOCK, and G. F. CAHILL (J. Biol. Chem., 1937, 119, 669—680, 681—687, 689—696; cf. A., 1935, 1153).—V. In a cystinuric patient, methionine (I) and cystine (II), fed as constituents of caseinogen and lactalbumin [(I):(II) ratio 9 and 1, respectively], underwent quant. and qual. catabolism in the same way as when fed as free  $\text{NH}_2$ -acids and in the same ratios in which they occur in the proteins. The data support the view that (I) is partly catabolised by conversion into cysteine and that (II) excreted in cystinuria is derived mainly from dietary (I).

VI. The compound (which supports the growth of rats on a *S*-deficient diet) is only partly oxidised to inorg.  $\text{SO}_4$  but is largely excreted as extra (II) and undetermined neutral *S*. The course of catabolism is discussed.

VII. None of the compounds yields extra (II). The *S* of *S*-methylcysteine is oxidised to an extent < that in normal men, whilst  $\gamma$ -thiobutyric acid is partly oxidised and partly excreted as *S*-*S* compound, probably the corresponding disulphide. F. O. H.

**Distribution of fat in the livers of depancreatized dogs maintained with insulin.** I. L. CHAIKOFF and A. KAPLAN (J. Biol. Chem., 1937, 119, 423—433).—The lipin content of the liver is increased in the depancreatized dog, but fatty acids are not uniformly distributed. The deviation in the contents of individual lobes from a mixed sample may reach 37%.

P. G. M.

**Effect of raw and autoclaved pancreas on the liver-lipins of the completely depancreatized dog maintained with insulin.** A. KAPLAN and I. L. CHAIKOFF (J. Biol. Chem., 1937, 119, 435—449; cf. this vol., 24).—A heat-labile factor exists in raw pancreas which produces a rise in blood-lipins of depancreatized dogs, along with a heat-stable factor which prevents fatty infiltration of the liver. The nature of the active factors is discussed. The level of fatty acids in the liver is  $>14\%$   $\leq 16\%$  weeks after pancreatectomy.

P. G. M.

**Effect of activity on the phospholipin and cholesterol content of muscle.** W. R. BLOOR (J. Biol. Chem., 1937, 119, 451—465).—Increased activity of muscle increases phospholipin (I) and cholesterol (II) contents and also the (I):(II) ratio. P. G. M.

**Phospholipin synthesis during fat absorption.** C. ARTOM, G. SARZANA, C. PERRIER, M. SANTANGELO, and E. SEGRE (Nature, 1937, 139, 1105—1106).—The synthesis of phospholipins during absorption of fat has been investigated in a rat fed on olive oil and radioactive Na phosphate. Some hr. after ingestion of the fat and radioactive P, relatively large quantities of the latter were detected in the phospholipins of the liver and of the gut. The kidneys showed a small but definite activity, whilst the heart, spleen, and skeletal muscle showed practically none (cf. this vol., 262). The rapid formation of phospholipins in liver and intestine during fat absorption must be regarded, not as a simple introduction of fatty acid radicals into the phospholipin mol., but as a complete synthesis starting, at least in part, from inorg. P.

L. S. T.

**Metabolism of fatty acids in the liver.** K. KOYAMA (J. Biochem. Japan, 1937, 25, 141—149).—Starvation in mice produces a decrease in the content of normal fatty acids (I) in the liver followed by a decrease in phosphatide-(I). With the former saturated, and with the latter unsaturated, (I) are principally metabolised. The decrease in (I) is inhibited by P poisoning.

F. O. H.

**Changes in weight and nitrogen content of adult worker bees on a protein-free diet.** M. H. HAYDAK (J. Agric. Res., 1937, 54, 791—796).—On a carbohydrate diet the dry matter and N content decreased, the greatest variation being observed in the abdomen and the least in the thorax.

H. G. R.

**Sexual variation in carbohydrate metabolism.** VIII. Rate of absorption of glucose and of glycogen formation in normal and adrenalectomized rats. H. J. DEUEL, jun., L. F. HALLMAN, S. MURRAY, and L. T. SAMUELS. IX. Effect of age or sex difference in content of liver-glycogen. H. J. DEUEL, jun., J. S. BUTTS, L. F. HALLMAN, S. MURRAY, and H. BLUNDEN (J. Biol. Chem., 1937, 119, 607—615, 617—620).—VIII. Absorption of glucose and glycogen formation in the liver of rats are not affected by adrenalectomy. The rates of the two processes in female rats are respectively  $>$  and  $<$  in males.

IX. The level of liver-glycogen in normal rats is max. ( $>8\%$ ) at the age of 39—40 days and then slowly decreases to an approx. const. level (4%) at 75 days. No sexual difference occurs at ages of 26—29 days or  $>17$  months but at other ages the level in the male is  $>$  that in the female.

F. O. H.

**Carbohydrate metabolism of brain.** IV. Brain-glycogen, free sugar, and lactic acid as affected by insulin in normal and adrenal-inactivated cats, and by adrenaline in normal rabbits. S. E. KERR, C. W. HAMPEL, and M. GHANTUS (J. Biol. Chem., 1937, 119, 405—421; cf. this vol., 92).—Insulin (2—15 units per kg.) decreases glycogen (I) and free sugar in the brain of normal and adrenal-

inactivated cats. Adrenaline, in doses sufficient to cause loss of (I) from liver and skeletal muscle, does not affect the brain-(I) and -lactic acid of fasting rabbits. P. G. M.

**Carbohydrate metabolism following irradiation of the pituitary.** M. PIJOAN and R. ZOLLINGER (Endocrinol., 1937, 21, 357—360).—Carbohydrate metabolism is unchanged by irradiation of the pituitary. P. G. M.

**Carbohydrate metabolism in hypophysectomised rats. I. Relation of method of glucose administration to the blood-sugar.** L. T. SAMUELS and H. A. BALL (Endocrinol., 1937, 21, 380—386).—The rate of intestinal absorption of glucose is decreased by 36% in hypophysectomised rats. Glucose tolerance is normal when administered by stomach tube for the first 2½ weeks but thereafter becomes diabetic in type, as it does within 1 week when injected subcutaneously. P. G. M.

**Coupling of dismutations with esterification of phosphate in muscle.** D. M. NEEDHAM and R. K. PILLAI (Nature, 1937, 140, 64—65).—From the effect of  $\text{CH}_2\text{I}-\text{CO}_2'$ , phloridzin, and  $\text{AsO}_4'''$  on the lactic acid formation in rabbit muscle extract it is deduced that the dismutation of triose phosphate with  $\text{AcCO}_2\text{H}$ , giving phosphoglyceric and lactic acids, is coupled with a synthesis of adenylyl pyrophosphate (I) from adenylic acid and free  $\text{PO}_4'''$ . This coupled esterification of  $\text{PO}_4$  probably plays an important part during the anaerobic recovery period when creatine phosphate is resynthesised. During this period heat output is low; the energy of dismutation may be retained and utilised in the endothermic synthesis of (I). L. S. T.

**Glyceraldehyde and embryonic glucolysis.** J. NEEDHAM and H. LEHMANN (Nature, 1937, 140, 198; cf. this vol., 306).—*l*- but not *d*-glyceraldehyde inhibits glucolysis. The inhibitory effect is complete at a concn. of approx.  $2.5 \times 10^{-3}M$ . The apparent inhibition of glucolysis by *dl*-glyceraldehyde to an extent  $>90\%$  is due to a slow enzymic formation of lactic acid (I) from glyceraldehyde itself. This process results from the non-enzymic formation of  $\text{AcCHO}$ , which is then converted into (I) by the glyoxalase present. L. S. T.

**Intermediary carbohydrate metabolism in embryonic life. I. General aspects of anaerobic glucolysis.** J. NEEDHAM and W. W. NOWIŃSKI. II. Formation and removal of pyruvic acid. III. Pasteur effect and the Meyerhof cycle. IV. Distribution of acid-soluble phosphorus. J. NEEDHAM, W. W. NOWIŃSKI, K. C. DIXON, and R. P. COOK. V. Phosphorylation cycles. VI. Glucolysis without phosphorylation. VII. Nature of non-phosphorylating glucolysis. J. NEEDHAM and H. LEHMANN (Biochem. J., 1937, 31, 1165—1184, 1185—1196, 1196—1199, 1199—1209, 1210—1227, 1227—1238, 1238—1254).—I. The anaerobic glycolytic mechanism of early chick embryonic life is systematically investigated. Autoglycolysis in the first week of development is small relatively to its max. glycolytic intensity and falls with increasing developmental age. It is not inhibitable with

glyceraldehyde (I),  $\text{F}'$ , or  $\text{HSO}_3'$  and it does not exceed the carbohydrate stores of the embryonic tissues. Besides glucose, mannose is the only carbohydrate glycolysed to any substantial degree and the decline of mannolysis with age follows exactly that of glucolysis. Glucosamine, fructose, galactose, sorbose, pentoses, di- and tri-saccharides, and usually all phosphorylated hexoses and glycogen are not utilised by the embryo. Substrate preference is probably not due to differences in permeability and embryo, like brain and tumour tissues, is predominantly a glucolysing system. The phosphorylation mechanism of glucose metabolism is not established even in muscle of chicks on the 15th day of development. Glucolysis is powerfully and specifically inhibited by *dl*-(I), the inhibition being partly reversible by pyruvate. Glucose remains intact during this inhibition. Methylglyoxalase is present in the embryo in the fully activated form and is not inhibited by (I). Addition of glutathione does not increase glucolysis by intact embryos.

II—IV. During glucolysis,  $\text{AcCHO}$  accumulates in small amounts and the amount is not increased by employing pulp the glucolytic activity of which has been decreased by dialysis.  $\text{AcCO}_2\text{H}$  (II) accumulates during autoglycolysis and glucolysis. The intensity of (II) formation reaches a max. after about ½ hr. glucolysis and then progressively falls off. At later stages (10th day) the rate of (II) formation is about the same although by this time uric acid excretion is established. Aerobically some lactate may be oxidised to (II). (II) formation during glucolysis is not affected by addition of vitamin- $\text{B}_1$ . In the onset of glycolysis after substrate deprivation there is an induction period which is abolished by addition of (II) or methylen-blue. The rates of aerobic and anaerobic glycolysis and the rate of oxidative disappearance of lactic acid in the chick embryo are measured. The rate of such oxidative disappearance is insufficient to account for the effect of  $\text{O}_2$  in reducing glycolysis, the metabolism thus resembling that of cerebral cortex. The K effect is absent in embryo, which thus differs from brain. The Pasteur effect is exhibited in the metabolism of mannose as well as of glucose. Small amounts of inorg. P, hexose diphosphate (III), and residual Ba-precipitable P are present at the 5th day of development. A very considerable amount of P is present in a form not precipitable by Ba, very resistant to acid hydrolysis, and not fermentable by yeast. The P distribution is also measured after varying periods of *in vitro* glucolysis. After a period of glucolysis inhibited by  $\text{F}'$ , there was no accumulation of (III) or of phosphoglyceric or glycerophosphoric acids as occurs in muscle under similar conditions, the only change being an accumulation of inorg. P. The various P fractions in embryo have little to do with carbohydrate breakdown.

V—VII. Co-enzyme I (cozymase of Harden and Euler) could not be detected in the chick embryo but co-enzyme II (hexose monophosphate codehydrogenase of Warburg) is present probably throughout development. P-transporting co-enzyme is present in small amounts. When P-transporters, e.g., adenylic acid (IV), adenylyl pyrophosphate (V), or

cozymase, are added to intact embryo pulp along with glycogen (VI) or hexose diphosphate (VII) a very slight amount of breakdown of these substances may occur but the effect is never of long duration and glycolysis quickly falls again. Addition of Mg makes no difference to this effect. Aldolase (zymohexase) which converts (VII) into triose phosphate (VIII) is present in embryo, (VIII) accumulating since the enzyme system is unable to convert (VII) into phosphoglyceric acid (IX). Enzymes effecting the reversible transformation of (IX) into phosphopyruvic acid (X), the transport of  $\text{PO}_4$  from (X) to (IV), and the dephosphorylation of (V) with formation of phosphagen or inorg.  $\text{PO}_4$  are all present in the embryo but the enzymes effecting esterification of (VI) are absent. The glucolytic rate is not affected either by addition of inorg.  $\text{PO}_4$  or by its almost complete removal by Ca or Be or by addition of (V), (IV), or cozymase or by their removal by dialysis. With 0.005*M*-NaF, the conversion of (IX) into (X) is completely suppressed, but glycolysis is only 45% suppressed. In all cases F' and (I) inhibitions are exactly the same whether hexokinase is present or absent, and it is concluded that two paths of carbohydrate breakdown exist (a very active non-phosphorylating glycolysis and a weak phosphorylating mechanism similar to that in muscle) and that breakdown in the living embryo goes on wholly without phosphorylation. Inhibition of glycolysis by *dl*-(I) is partly reversed by presence of (VII) which is converted into (VIII), the latter then combining with (I) to form hexose monophosphate. Glycolysis is inhibited with dialysed pulp and activity 80% restored by addition of glutathione (XI) whether the methylglyoxalase present has been irreversibly inactivated or not, suggesting that  $\text{AcCHO}$  is not an intermediate in glycolysis. (XI) cannot be replaced by cysteine, ascorbic acid, vitamin- $\text{B}_1$ , or (II). Gluconic acid, glycerol, glyceric acid, (II), and  $\text{CO}(\text{CH}_2\text{OH})_2$  are not intermediates in non-phosphorylating glycolysis, but optically active (I) cannot yet be excluded.

P. W. C.

#### Oxidation of $\text{C}_4$ dicarboxylic acids by tissue.

E. ANNAU and F. B. STRAUB (Z. physiol. Chem., 1937, 247, 252—257; cf. this vol., 127; Innes, A., 1936, 1547; Stare and Baumann, this vol., 61).—The  $\text{O}_2$  uptake of pigeon breast muscle is increased by addition of physiological amounts of fumaric acid (I) which are not attacked by the tissue.  $\text{AcCO}_2\text{H}$  added at the same time reduces the uptake by suppressing the catalytic action of (I). When excess of (I) is added part (max. 20—30%) undergoes oxidation. Quantitatively  $\text{C}_4$  dicarboxylic acids are not important intermediate products of tissue metabolism.

W. McC.

Metabolism of lactic and pyruvic acids in normal and tumour tissues. III. Rat liver, brain, and testis. K. A. C. ELLIOT, M. E. GREIG, and M. P. BENOY. IV. Formation of succinate. K. A. C. ELLIOT and M. E. GREIG (Biochem. J., 1937, 31, 1003—1020; 1021—1032; cf. A., 1935, 1273).—III. In liver-tissue lactate (I), pyruvate (II), and acetate (III) are oxidised; succinate (IV) is converted into fumarate (V) and partly into malate (VI). In

brain and testis (I) and (II) are oxidised, (IV) is oxidised to (V) and (VI), and these are further oxidised to some extent. (III) is not appreciably oxidised by brain and testis but is slowly oxidised by testis in presence of glucose. Under anaerobic conditions testis produces an acid, not lactic, and is the only tissue tried which shows a considerable metabolism of (II), the reaction involving a dismutation giving (I), (III), and  $\text{CO}_2$ . In liver, brain, kidney, and in tumours, only a slight  $\text{CO}_2$  evolution occurs. Liver and brain slices show a rapid aerobic glycolysis during the first few min. after introduction into fresh medium.

IV. Modified applications of the method of Moyle (A., 1924, i, 791) and of Gozsy (A., 1935, 1406) for determining (IV) in tissue extracts are described. In kidney cortex, (II) is converted into (IV) and accumulates in large amounts, when its further oxidation is inhibited by malonate (VII), the (IV) being isolated and identified. With other tissues, the amount of (IV) formed is smaller. Manometric experiments show that (VII) inhibits oxidation of (IV) by at least 90% in tissue slices and decreases the rate of metabolism of (II) and (VI) in kidney slices to the same extent. A considerably larger amount of (IV) is produced from (VI) and from oxaloacetate than from (II) in kidney cortex and small amounts of (IV) are formed from (III) in kidney and liver. The mechanism of the changes involved is discussed.

P. W. C.

Water metabolism in relation to the menstrual cycle. P. L. KROHN and S. ZUCKERMAN (J. Physiol., 1937, 88, 369—387).

R. N. C.

Salt and water metabolism of nephrectomised rabbits. I. Effect of injection of water or glucose solutions. W. J. O'CONNOR (Austral. J. Exp. Biol., 1937, 15, 97—107).—Na and Cl are capable of entering the blood and extracellular tissue fluids, being liberated from some depôt when these fluids are diluted by hypotonic injections of salt-free  $\text{H}_2\text{O}$ . In the absence of kidneys the animal cannot, however, regulate its blood vol. The adjustment is accompanied by hyperpnœa.

R. M. M. O.

Metabolism of water, chloride, potassium, sodium, calcium, magnesium, and phosphorus in adrenalectomised rats. M. SANDBERG, D. PERLA, and O. M. HOLLY (Endocrinol., 1937, 21, 352—356).—Ca and Mg retention is unchanged after adrenalectomy.  $\text{H}_2\text{O}$  intake is const. but rises during NaCl treatment; % retention of Cl' remains unchanged, since urine vol. increases. The % of K retained falls, but urinary and faecal P excretion is slightly increased. The significance of the changes is discussed.

P. G. M.

Influence of training on the calcium and magnesium content of rabbit, pigeon, and chicken muscles. P. A. VERBOLOVITSCH (Biochimia, 1937, 2, 571—579).—The Ca and Mg contents of the muscles show a slight rise and fall, respectively, after training. The effect is greatest in the case of chicken muscles.

R. T.

Elimination of molybdenum in the bile. F. CAUJOLLE (Bull. Soc. Chim. biol., 1937, 19, 827—836).—After intravenous injection of  $\text{NH}_4$  molybdate

into dogs, the Mo is eliminated as  $\text{MoO}_4^{--}$  in the bile and urine. A. L.

**Structure of substances, natural and synthetic, and their reactions on the body.** E. C. DODDS (Lancet, 1937, 233, 1—5).—An address.

L. S. T.

**Regulation of vital phenomena by traces of substances.** M. BETTI (Atti R. Accad. Lincei, 1936, 4, 498—507).—A lecture on the role of metals, vitamins, and hormones.

F. O. H.

**Pharmacological experiments on mammalian voluntary muscle, in relation to the theory of chemical transmission.** Z. M. BACQ and G. L. BROWN (J. Physiol., 1937, 89, 45—60).

R. N. C.

**Phenomenon of partial racemism as the heuristic principle of the interpretation of physiological specificity observations.** H. LETTRÉ (Angew. Chem., 1937, 50, 581—588).—A consideration of additive compounds of optically active substances, racemates, and partial racemates, the reaction between chemically defined antigens and their antibodies, the stereochemical specificity of enzymes, the differences in the physiological activity of optical antipodes, and the significance of the occurrence of optically active substances in biological conditions.

H. W.

**Production of local depressions in the development of *Drosophila* pupæ.** A. A. WOLSKY (Nature, 1937, 139, 1069—1070).—By means of partial illumination in presence of CO, these depressions can be induced in regions that are not illuminated. Respiration of the pupæ is depressed by CO, an effect that is reversible, to a certain extent, in light. This is interpreted as a dissociation, under the influence of light, of the compound formed between CO and the Fe-containing respiratory enzyme.

L. S. T.

**Application of artificial radioactivity in therapeutics.** A. LAFAY and B. LAFAY (Compt. rend., 1937, 204, 1593—1594).—Intravenously injected NaI which has been bombarded with neutrons (cf. A., 1934, 1151), and consequently emits  $\beta$ -rays, is as beneficial in the treatment of rheumatism as meso-Th', Th-X, and Rn. Deep-seated cancerous growths are treated more effectively by this method than by deep X-ray therapy. Accumulation of radioactive NaI in the growths enables them to be readily located.

J. L. D.

**Retention of radioactive substances in the body of rats and the lethal dose.** F. BÉHOUNEK and F. V. NOVAK (Nature, 1937, 140, 106).—With 10% glucose solution as a vehicle 0.5 to 14 millicuries of Rn are eliminated from the body of rats in 30 min., irrespective of the method of injection (intramuscular or subcutaneous). With an emulsion of W in olive oil, several hr. are necessary. In both cases, elimination is effected mainly by breathing. A dose of 14 millicuries does not even disturb the basic vital functions. With the W emulsion the 14 millicurie dose corresponds with approx.  $17 \times 10^6$  ergs of energy absorbed. In the case of Po injections the lethal dose is reached at an average absorbed energy of approx.  $6 \times 10^6$  ergs.

L. S. T.

**Biological effects of slow electrons.** F. S. COOPER and S. H. HUTNER (Physical Rev., 1936, [ii], 49, 480).—Preliminary. The effect of evacuation to  $10^{-3}$  to  $10^{-5}$  mm. on the spores of *Nephrolepis*, *Polypodium*, *Scolopendrium*, and *Neurospora* is recorded.

L. S. T.

**Production of mutations by neutrons.** M. NAGAI and G. L. LOCHER (Nature, 1937, 140, 111—112).—Adult males of *Drosophila melanogaster* treated with fast neutrons from a Ra-Be source show a larger proportion of mutations than untreated flies.

L. S. T.

**Effects of alcohol as influenced by blood-sugar.** H. W. HAGGARD and L. A. GREENBERG (Science, 1937, 85, 608—609).—In rats and in man the increase in blood-sugar following a meal lessens the pharmacological effect of alcohol that has been absorbed. The lethal concns. of alcohol (commercial spirits) in the blood of rats determined for different sugar levels show that the toxicity of alcohol varies inversely as the concn. of sugar. The modifying effects of sugar on the action of alcohol appear to be connected with the combustion of the latter in the tissues.

L. S. T.

**Pharmacology of gallic acid. II. Effect of gallic acid on the diuresis due to hypertonic sodium chloride solutions.** M. FILOMENI (Arch. Farm. sperim., 1937, 63, 193—224).—Rabbits which have been intravenously injected with N-NaCl (which increases aq. and reduces NaCl-diuresis), when further injected with gallic acid (0.01—0.15 g. per kg.) show a 38% increase in aq., and a negligible increase in NaCl-, diuresis.

E. W. W.

**Pharmacology of gallic acid. III. Effect on diuresis following intravenous injection of water.** M. FILOMENI (Arch. Farm. sperim., 1937, 64, 1—52; cf. preceding abstract).—With rabbits continuously injected with 0.5 c.c. of  $\text{H}_2\text{O}$  per kg. per min. until death occurs, the vol. of urine and amount of NaCl excreted and the survival period are increased by intravenous injection of gallic acid.

F. O. H.

**Hyperglycæmia following adrenalectomy.** T. OZAKI (J. Biochem. Japan, 1937, 25, 133—139).—Intravenous injection of cholesterol (I) into rabbits causes parallel increases in the blood-sugar (Hagedorn-Jensen), -(I), and -cholesteryl esters which persist for approx. 8 hr. The bearing of the data on the hyperglycæmia following adrenalectomy is discussed.

F. O. H.

**Alcohol content of the water of interstitial fluid and protoplasm of an aquatic animal and that of the medium surrounding it. Experimental demonstration in the frog.** M. NICLOUX (Compt. rend., 1937, 204, 1532—1535).—The urine and  $\text{H}_2\text{O}$  of plasma, interstitial and tissue fluid, and protoplasm of a frog immersed in 0.2% aq. EtOH contain the same concn. of EtOH as the external medium.

J. L. D.

**Partial permeability to alcohol of the isolated skin of the frog.** G. FONTES (Compt. rend. Soc. Biol., 1937, 125, 900—903).—The undamaged skin is only partly permeable to EtOH, max. equilibrium vals. of 0.93 being attained (cf. this vol., 132).

H. G. R.

**Cetyl alcohol as an enteric coating material.** L. M. MILLS (J. Amer. Pharm. Assoc., 1937, 26, 479—482).—Tablets of  $\text{BaSO}_4$  coated with cetyl alcohol (I), (I) + shellac, and (I) + mastic passed intact through the human stomach and disintegrated in the intestine to an extent of approx. 81, 71, and 98%, respectively.

F. O. H.

**Renal excretion of acid dyes in *Astacus fluviatilis*.** P. GÉRARD (Bull. Acad. roy. Belg., 1937, [v], 23, 456—463).—The results of examination of the kidney apparatus in crayfish following injection of various acid dyes are discussed with reference to renal permeability.

J. N. A.

**Calcium creosotate. II. Comparative *in-vitro* efficiency of calcium creosotate and guaiacolate and creosote as bactericidal agents. III. Elimination of volatile phenols in rabbit's urine after administration of "calcium creosotate solution" and after creosote solution.** E. J. FELLOWS (J. Pharm. Exp. Ther., 1937, 60, 178—182, 183—188).—II. Ca creosotate (I) is effectively bactericidal at higher dilutions than creosote (II) or Ca guaiacolate.

III. Given orally to rabbits, (I) produces more phenol in the urine than (II); hence the absorption in the body of phenols from (I) is probably at least as efficient as from (II).

E. M. W.

**Experimental assessment of the therapeutic efficacy of amino-compounds with special reference to *p*-benzylaminobenzenesulphonamide.** L. E. H. WHITBY (Lancet, 1937, 232, 1517—1519).—The following compounds are effective in the oral treatment of streptococcal infections in mice: *p*- $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  (I), *p*- $\text{CH}_2\text{Ph}\cdot\text{NH}\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  (II), 4:4'-diaminobenzenesulphonanilide tartrate (III), and 4:3'-diaminobenzenesulphonanilide (V). Of the sol. compounds, prontosil (sol.) and  $\text{Na}_2$  *p*-( $\gamma$ -phenylpropylamino)benzenesulphonamide- $\alpha\gamma$ -disulphonate (IV) are equally less efficient than the above. (I) and (III) are equally effective against meningococcus in mice; (II) and (IV) are inactive in experimental infections. With pneumococcus type I, (III) and (V) have a definite protective action, but (I), (II), and (IV) have no action in preventing death.

L. S. T.

**Antiseptics and anthelmintics. III. Pharmacology of certain flavones with special reference to their anthelmintic action.** H. S. MAHAL (Proc. Indian Acad. Sci., 1937, 5, B, 186—194).—7-Hydroxy- and 7-hydroxy-6-hexyl-flavone, chrysin, genkwanin, calycopterin, and 4-methylumbelliferone exhibited no anthelmintic, germicidal, or antiseptic activity. They inhibited the movement of isolated rabbit gut and uterus, lowered blood pressure in dogs, and inhibited the beat of isolated frog heart.

A. G. P.

**Spermicidal powers of chemical contraceptives. VII. Approved tests.** J. R. BAKER, R. M. RANSON, and J. TYNEN (J. Hyg., 1937, 37, 474—488).—Consistently reliable results are given by a test on human semen at 37°. The efficiency of a commercial product depends on its rate of diffusion, acidity or alkalinity, and the rate of disintegration. A special test for diffusion is described. A method of

determining the  $p_H$  of human semen is given (mean 7.8; range 7.4—8.4). The mean ejaculated vol. is 3.9 ml., which requires 0.31 ml. of 0.1N-HCl for neutralisation.

W. L. D.

**Cleavage of certain azo-compounds in the animal organism and the allergic phenomena produced by sulphonamidochrysoidine.** F. NITTI and D. BOVET (Bull. Soc. Chim. biol., 1937, 19, 837—842).—A study of the allergic phenomena produced by sulphonamidochrysoidine and 1:2:4- $\text{C}_6\text{H}_3(\text{NH}_2)_3$  shows that certain azo-compounds such as derivatives of *p*- $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  are readily reduced by the organism and may sensitise the organism as a result of the cleavage products formed.

A. L.

**Acetylcholine metabolism of a sympathetic ganglion.** G. L. BROWN and W. FELDBERG (J. Physiol., 1936, 88, 265—283).—Prolonged preganglionic stimulation causes an initially high output of acetylcholine (I) from the perfused superior cervical ganglion of the cat, but this falls rapidly to a steady low val. Synthesis of (I) appears to take place, and is unaffected by eserine. The amount of extractable (I) or choline from a ganglion is not significantly altered.

R. N. C.

**Action of eserine and related compounds and of acetylcholine on the central nervous system.** A. SCHWEITZER and S. WRIGHT (J. Physiol., 1937, 89, 165—197).

R. N. C.

**Action of acetylcholine, prostigmine, and related substances on the knee-jerk.** A. SCHWEITZER and S. WRIGHT (J. Physiol., 1937, 89, 384—402).

R. N. C.

**Action of acetylcholine on denervated mammalian and frog's muscle.** G. L. BROWN (J. Physiol., 1937, 89, 438—461).

R. N. C.

**Mechanism of sensitisation to acetylcholine.** E. KAHANE and J. LÉVY (Compt. rend., 1937, 204, 1752—1754; cf. this vol., 265).—Eserinised leech muscle only partly destroys acetylcholine (I) in Ringer's fluid, so that the site of action of eserine (II) is not located outside the muscle. A very small portion of the esterase is inhibited because an inactive form diffuses from the muscle; after repeated washing, active esterase once more diffuses out and the hypersensitivity of the muscle to (I) is abolished. The sensitising effect of (II) is > suppression of the activity of the esterase.

J. L. D.

**Acetylcholine and choline-esterase in invertebrates.** Z. M. BACQ (Arch. internat. Physiol., 1937, 44, 174—189).—Acetylcholine (I) has a contractile effect on the muscles of worms, sipunculi, molluscs, and echinoderms and choline-esterase (II) is present in the tissues and body-fluids. (I) is without effect on actinia and crustaceans and (II) is present in the muscle but not in the blood of the latter.

H. G. R.

**Insensitivity of the cervix uteri to oxytocin.** W. H. NEWTON (J. Physiol., 1937, 89, 309—315).

R. N. C.

**Chemical agent in the sympathetic control of retraction of the nictitating membrane of the cat.** J. SECKER (J. Physiol., 1937, 89, 296—308).

R. N. C.

**Effects of ether on brain oxidations.** M. JOWETT and J. H. QUASTEL (Biochem. J., 1937, 31, 1101—1112).—The respiration of slices of cerebral cortex (rat, guinea-pig) with glucose (I), fructose, pyruvate, lactate (II), or glutamate as substrate is inhibited by  $\text{Et}_2\text{O}$ ; with succinate and some other substrates, inhibition is slight. The inhibition is progressive, irreversible when large, and tends to be larger when  $[\text{K}^+]$  is low. The inhibitory action of  $\text{Et}_2\text{O}$  on oxidation of (I) or (II) has a high temp. coeff. (about 6 for  $10^\circ$ ). The brain of anaesthetised rats has a normal *in-vitro* respiration. The effects on liver respiration are not so significant. The bearing of the findings on  $\text{Et}_2\text{O}$  anaesthesia is discussed.

F. O. H.

**Relation of barbital and phenobarbital to granulocytopenia.** J. C. KOPET and F. J. GOODRICH (J. Amer. Pharm. Assoc., 1937, 26, 483—485).—The two drugs (diethyl- and phenylethyl-barbituric acids) do not permanently decrease the no. of circulating granulocytes in the peripheral blood of rabbits.

F. O. H.

**Comparison of ultra-short-acting barbiturates, nembutal, and tribromoethanol.** H. W. WERNER, T. W. PRATT, and A. L. TATUM (J. Pharm. Exp. Ther., 1937, 60, 189—197).—Toxicity and duration of action of five barbiturates and tribromoethanol are compared.

E. M. W.

**Pharmacology of thiobarbiturates.** O. M. GRUZHIT, A. W. DOX, L. W. ROWE, and M. C. DODD (J. Pharm. Exp. Ther., 1937, 60, 125—142).—Six thiobarbituric acids possess anaesthetic properties when given intravenously, intraperitoneally, or orally to rats and dogs. Data are given of min. anaesthetic and lethal doses and of effects on respiration and cardiac function.

E. M. W.

**Variation of the mode of action of local anaesthetics on the motor nerve with chemical type. Cocaine and its substitutes; percaine.** J. RÉGNIER and A. QUEVAUVILLER (Compt. rend. Soc. Biol., 1937, 125, 720—723).—The action of cocaine and novocaine differs from that of percaine.

H. G. R.

**Comparative effect of various morphine salts, injected intravenously, on cocaine local anaesthesia.** J. RÉGNIER and S. LAMBIN (J. Pharm. Chim., 1937, [viii], 25, 533—537).—The effect of different salts of morphine in causing "renewal" of anaesthesia is in the order phenylbutyrate > phenylpropionate > benzoate > hydrochloride = tartrate > citrate > gluconate.

J. N. A.

**Local anaesthetics.**—See A., II, 386.

**Effect of purine bases and their derivatives on ureteral peristalsis.** C. CELLA and I. D. GEORGESCU (Compt. rend. Soc. Biol., 1937, 125, 760—762).—Caffeine, theobromine, and theophylline increase the rate of peristalsis.

H. G. R.

**Action of vascular medicaments on the permeability of arteries.** L. ZETTLER (Arch. exp. Path. Pharm., 1937, 185, 141—152).—Tables show the decrease of permeability of surviving arteries induced by Ca and nicotine and the increase of permeability due to purine and Hg diuretics and to  $\text{NaNO}_2$ .

P. W. C.

**Changed activity of morphine in rickets.** C. AMSLER (Arch. exp. Path. Pharm., 1937, 185, 263—266).—The central nervous system of young, growing white rats is so altered when the animals are rendered rachitic by feeding a McCollum diet that the narcotising action of morphine is decreased and the stimulant activity increased in about one third of the animals.

P. W. C.

**Chemistry of Indian opium.** H. B. DUNNICLIFF (Nature, 1937, 140, 92—93).

L. S. T.

**Mechanism of strychnine action. I. Physiological evaluation.** A. VIEHOEVER and I. COHEN (Amer. J. Pharm., 1937, 109, 285—316).—The use of *Daphnia magna* as a test animal affords accurate determination of concn. and confirms that chemically pure samples of different origin show uniformity in their action (cf. Ward *et al.*, A., 1936, 1295).

R. M. M. O.

**Circulatory and pulmonary effects of the venom of the Australian copperhead (*Denisonia superba*).** W. FELDBERG and C. H. KELLAWAY (Austral. J. Exp. Biol., 1937, 15, 81—95).—The effects are due to cell injury and to secondary reactions to the histamine thus liberated.

R. M. M. O.

**Pharmacological and toxic actions of *d*- and *l*-motine.** A. C. WHITE and E. STEDMAN (J. Pharm. Exp. Ther., 1937, 60, 198—223).—The toxicities and actions on various systems, isolated organs, and tissues of *d*- and *l*-motine are compared for many species of animals. *l*-Miotine has the stronger effect in most cases. No direct relationship is observed between toxicity and relative power of inhibiting serum-choline esterase.

E. M. W.

**Opposite effects of two alkaloids of the same vegetable drug.** E. BIZET and RAYMOND-HAMET (Compt. rend., 1937, 204, 1754—1756).—The effect on carotid pressure and kidney vol. (dog) of adrenaline injection following injection of quebrachamine sulphate is opposite to that following injection of quebrachamine hydrochloride.

J. L. D.

**Pharmacology of metasynephrin.** E. M. BOYD (J. Pharm. Exp. Ther., 1937, 60, 174—177).—Metasynephrin (I) is more stable in solution than adrenaline (II) and less toxic to mucous surfaces than (II) or ephedrine. (I) and (II) are similar in pharmacological action.

E. M. W.

**"Amphiporine" and "nemertine": poisons obtained from nemertines.** Z. M. BACQ (Arch. internat. Physiol., 1937, 44, 190—204).—"Amphiporine," obtained from the tissues of *Amphiporus* and *Drepanophorus*, is an alkaloid with nicotine-like action, whereas "nemertine" has no such action but excites the muscle-nerve prep. of the crab.

H. G. R.

**Transfer of some drugs into mothers' milk.** T. A. G. HAANAPPEL (Pharm. Weekblad, 1937, 74, 871—880).—The I content of human milk rose to  $2.5 \times 10^{-5}$  g. per c.c. after administration of 1 g. of NaI. The sample was evaporated with  $\text{K}_2\text{CO}_3$ , ignited, extracted with EtOH, and the I determined in the dried extract by the  $\text{NaN}_3$ -Br- $\text{H}_2\text{SO}_4$  method. Small amounts of Br are conveniently determined

colorimetrically as eosin by treatment with fluorescein and  $\text{NH}_2\text{Cl}$  solution at  $p_{\text{H}}$  5.5–5.6. The Br content of milk is very high, 0.6 mg. per c.c. after administration of large doses of NaBr (6.5 g. in 2 days). Only traces of As ( $1 \times 10^{-7}$  g. per c.c.) appear in the milk after administration of 35 mg. of  $\text{As}_2\text{O}_3$ . Quinine is determined nephelometrically with Valser's reagent ( $\text{HgI}_2\text{-KI}$ ) or by the fluorescence in ultra-violet light. Milk contains  $1 \times 10^{-6}$  g. per c.c. 3 hr. after administration of 250 mg. of quinine and none after 12 hr.  $o\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{H}$  and  $o\text{-OAc}\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{H}$  are determined colorimetrically with  $\text{FeCl}_3$ . The max. content observed was 0.35–0.45 mg. per 100 c.c. 12 hr. after administration of 1 g. of  $o\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{Na}$ . S. C.

**Chemico-toxicological detection of thymol.** L. PILATI (Boll. Chim. farm., 1937, 76, 301–302, 305).—Tissues suspected of containing thymol (I) are treated with NaOH-EtOH, and excess of EtOH; dil.  $\text{H}_2\text{SO}_4$  is added to the evaporated filtrate, and the (I) in the evaporated  $\text{Et}_2\text{O}$  extract (after distillation in  $\text{H}_2\text{O}$  if necessary) is detected by its odour. When treated in  $\text{H}_2\text{SO}_4$  with  $\text{CH}_2\text{O}$ , (I) gives violet streaks passing to a maroon coloration; such colour reactions of other phenols are recorded.

E. W. W.

**Relationship between the action of convulsive poisons and disturbance of tissue respiration.** I. Pyrimidone convulsions in frogs after administration of subnormal doses of pyrimidone and hydrocyanic acid. R. LABES, K. WEDELL, and O. LIPPEROSS (Arch. exp. Path. Pharm., 1937, 185, 125–140).—In frogs, injection of half the normal convulsive dose of pyrimidone (I) (0.23 c.c. of a 4% solution) is sufficient to cause convulsions if 0.045 c.c. of a 0.75% NaCN solution is injected either simultaneously with or earlier than the injection of (I).

P. W. C.

**Distribution of chloroform and chloral hydrate during experimental chloral hydrate poisoning.**

(A) Oral, rectal, and peritoneal administration. (B) Subcutaneous and intravenous administration. C. BONCIU and N. IOANID (Compt. rend. Soc. Biol., 1937, 125, 771–774, 775–778).—The bile and blood of rabbits contain > the other organs, the vals. for which are variable. No appreciable differences were observed with varying degrees of poisoning.

H. G. R.

**Action of certain enzyme poisons on the frog's auricle.** A. S. DALE (J. Physiol., 1937, 89, 316–329).—CN' in sufficient concn.,  $\text{H}_2\text{S}$ , and  $\text{NaN}_3$  show actions similar to complete deprivation of  $\text{O}_2$  on the frog's auricle poisoned with  $\text{CH}_3\text{I}\cdot\text{CO}_2\text{H}$ . The  $\text{O}_2$  uptake of the auricle is not completely abolished by CN' in concns. up to  $M/150$ .

R. N. C.

**Diagnosis of chronic benzene poisoning.** FRIEMANN (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 278–283).—Poisoning by  $\text{C}_6\text{H}_6$  is frequently accompanied by diminished urinary elimination of vitamin C.

M. A. B.

**Testing the liver function in mercury workers.** D. G. TALLENBURG (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 305–315).—Clinical tests on blood and urine

show disturbance of liver function even in apparently healthy workers.

M. A. B.

**Chronic mercury and amalgam poisoning.** A. STOCK (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 388–413).—The Hg content of various rocks and soils, natural waters, foodstuffs, and human excreta and blood is determined. Data are given showing the distribution of Hg in different organs of the dog after exposure to air containing Hg. Hg is much more toxic when absorbed through the respiratory tract than through the alimentary canal and as little as  $10\text{--}20 \times 10^{-6}$  g. per cu. m. in the air will produce definite symptoms in man after exposure for a few hr. per day for several weeks. Poisoning may even be caused by the amalgam in teeth-stopping.

M. A. B.

**Lead-poisoning risks in type-setting.** E. LEDEBERER (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 331–377).—Chemical data together with Pb analyses of urine of workers, of dust and of washing- $\text{H}_2\text{O}$  in printing works are recorded and discussed.

M. A. B.

**Liver affections in lead poisoning.** K. FELLINGNER (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 414–420).—Relations between Pb poisoning, the level of serum-bilirubin and -cholesterol, and galactose metabolism are examined.

M. A. B.

**Gas analysis apparatus.** W. WIRTH and W. TAMM (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 427–429).—Apparatus for sampling gases in toxicological work is described.

M. A. B.

**Fluorine poisoning in cryolite workers.** K. ROHOLM (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 255–277).—The air of factories using cryolite contains about 35 mg. per cu. m. Some of this is absorbed through the alimentary canal, but not through the respiratory tract, and may cause disturbed mineral metabolism with increased calcification of bones.

M. A. B.

**Immunity of certain insects to selenium poisoning.** S. F. TRELEASE and H. M. TRELEASE (Science, 1937, 85, 590).—Weevils and seed-chalcids are able to complete their life cycles in seeds of *Astragalus bisulcatus* containing 1475 p.p.m. of Se. The bodies of the weevils contained 65 p.p.m. of Se.

L. S. T.

**Effect of cystine on toxicity and trypanocidal activity of neoarsphenamine.** A. E. JURIST and W. G. CHRISTIANSEN (J. Amer. Pharm. Assoc., 1937, 26, 497–501).—The toxicity in rats is not changed by oral administration (after 24 hr.) of cystine whilst the trypanocidal efficiency is significantly reduced.

F. O. H.

**Action of poisons on the isolated heart-muscle strip of the frog. III. Action of metallic salts.** K. MEZEY (Arch. exp. Path. Pharm., 1937, 185, 153–177; cf. A., 1936, 1295).—A table shows the min. active concn. of the chlorides of 38 elements, including most of the rarer elements, on the heart-muscle strip, and a second table indicates the proportionate min. active cation concn. starting with

Cs — 1. The degree of activity follows the accompanying schemes: Cs < Li < Na < Rb < K; Sr < Ca < Ba; Mg < Zn < Cd < Be; Ti < Ce < Zr < Th < La < Al < Ti < Nd < Y; Cr < Pb < Sn < Bi < U < W; Fe < Co < Mn < Ni. P. W. C.

**Histophysiology of pulmonary lipins. Fatty lungs in poisoning.** L. BINET, J. VERNE, and J. L. PARROT (Compt. rend. Soc. Biol., 1937, 125, 712—714).—Accumulation of lipins in the lung follows fungal infection or P poisoning.

H. G. R.

**Determination of the toxicity of medicinal substances.** J. RÉGNIER, S. LAMBIN, and E. SZOLLESI (Bull. Sci. Pharmacol., 1937, 44, 81—108).—Methods of testing substances of which only a small quantity is available are discussed. Data are given of the toxicity towards mice of some new salts of novocaine and morphine.

L. D. G.

**Schutz-Borissov law for enzymes.** O. BODANSKY (Science, 1937, 86, 52—53).—A discussion.

L. S. T.

**Alcohol dehydrogenase of turnips.** S. YAMAGATA and M. NAGAHISA (Acta. Phytochim., 1937, 9, 115—122).—Treatment of the expressed juice with EtOH—Et<sub>2</sub>O at <0° gives a white enzyme powder which remains active for months if preserved in a desiccator. It rapidly loses its activity in H<sub>2</sub>O at room temp. but not at 0° and is almost completely inactivated at 55° for 30 min. It is indifferent towards CH<sub>3</sub>I·CO<sub>2</sub>Na, NaF, and KCN but strongly inhibited by NH<sub>2</sub>·CO<sub>2</sub>Et. Formate, lactate, succinate, malate, citrate, aspartate, glycine, and glutarate are useless as H-donators. Glutamate is more active than EtOH but the position of glucose and glycerophosphate is uncertain. BuOH appears particularly suitable. The action depends on the concn. of the substrate. The optimal *p*<sub>H</sub> is 7—7.5. The necessity of a codehydrogenase for the activity of the dehydrogenase is shown. The participation of the flavin enzyme in this dehydrogenation is probable.

H. W.

**Malic dehydrogenase.** K. LAKI (Biochem. J., 1937, 31, 1113—1115).—Muscle (horse) preps., which are poor in fumarase, dehydrogenate malate (I) faster than fumarate (II). This supports the view that (I) is dehydrogenated as such and not as (II) (cf. Green, this vol., 29).

F. O. H.

**Identity of lactic and malic dehydrogenases.** N. B. DAS (Biochem. J., 1937, 31, 1116—1123).—Lactic and malic dehydrogenases occur in pigeon's heart-muscle and pig's kidney, liver, and heart. Both are inhibited by oxalacetic acid (I), H<sub>3</sub>AsO<sub>3</sub>, and CH<sub>3</sub>I·CO<sub>2</sub>H but F' and AcCO<sub>2</sub>H (II) inhibit only lactic dehydrogenase. Malic dehydrogenase (which is activated by cozymase free from adenylic acid) is more readily inhibited by (I) than lactic dehydrogenase is by (II). The max. concn. of malic is much < that of lactic acid. In presence of glutamic acid, which combines with (I), the relative velocities of dehydrogenation are approx. equal. No summation or addition occurs with the two substrates together. The enzymes are not separable by adsorption with kaolin.

F. O. H.

**Inhibition of succinic and lactic-malic dehydrogenases.** N. B. DAS (Biochem. J., 1937, 31, 1124—1130).—The inhibition of dehydrogenation of lactic acid (I) by AcCO<sub>2</sub>H (II) is > that of hydrogenation of (II) by (I); this is also true for the corresponding reactions of malic (III) and oxalacetic acid (IV), but the reverse applies when succinic (V) and fumaric acid (VI) are used, respectively. Malonic acid (VII) inhibits dehydrogenation of (I) more strongly than hydrogenation of (II); the reverse holds for the cases of (III) and (IV), respectively. (IV) and (VII) inhibit dehydrogenation of (V) more readily than hydrogenation of (VI), whilst (I) and (III) are without effect on both enzymic processes. The bearing of the results on the theory of tissue respiration is discussed.

F. O. H.

**Dehydrogenation of pyruvic acid.** E. ANNAU and I. MAHR (Z. physiol. Chem., 1937, 247, 248—251; cf. this vol., 127).—In presence of a dehydrogenase of high activity occurring in pigeon breast muscle and pig kidney AcCO<sub>2</sub>H decolorises methylene-blue. The dehydrogenating system consists of an enzyme and a thermostable activator (resists temp. of 80°), not identical with Warburg's yellow enzyme, cozymase, or adenosine triphosphate, which accelerates the dehydrogenation but has no effect on the dehydrogenation of lactic acid.

W. McC.

**Cell structure and enzymic activity.** J. YUDKIN (Biochem. J., 1937, 31, 1065—1068).—The decrease in activity of the glucose dehydrogenase of *Bact. coli* by freezing and thawing, and of the glucose and lactic dehydrogenases of *Micrococcus lysodeikticus* by lysis with egg white, are not restored by addition of the co-enzyme necessary for their action. In these instances the effect is not therefore due merely to dilution but the enzymes appear to be linked in some way with the structure of the cell.

P. W. C.

**Ascorbic acid oxidase in plant and animal tissues.** R. K. CHAKRABORTY and B. C. GUHA (Indian J. Med. Res., 1937, 24, 839—843).—The oxidase (I) contents of a no. of plant tissues are given. Cucumber shows the highest val. (I) is produced in gram on germination. It is apparently absent from animal tissues.

R. N. C.

**"Ascorbic acid oxidase" and copper.** E. STOTZ, C. J. HARRER, and C. G. KING (J. Biol. Chem., 1937, 119, 511—522).—Substances (e.g., NEt<sub>2</sub>·CS<sub>2</sub>H, 8-hydroxyquinoline) which specifically inhibit the catalytic action of Cu likewise inhibit, to approx. the same extent, that of the supposed ascorbic acid oxidases (I) of vegetable juices (e.g., cabbage, cauliflower) as well as that of Cu-gelatin and Cu-albumin compounds, but do not affect the action of nicotine-haemochromogen. Inorg. Cu when mixed with protein assumes properties (e.g., catalytic effect optimal at particular *p*<sub>H</sub>, inactivation by heat and acid, relation between rate of action and concn. of substrate) similar to those of (I). Possibly (I) are Cu complexes in which Cu is bound as in the Cu compounds of biuret and of haematoporphyrin which also catalyse oxidation of ascorbic acid.

W. McC.

**Reversible oxidation and reduction of co-enzyme I.** D. E. GREEN and J. G. DEWAN (Biochem. J., 1937, **31**, 1069—1073).—Reduced coenzyme I (I) is oxidised completely by pyruvate, oxaloacetate, and fumarate, and partly by acetoacetate, in the presence of their respective dehydrogenases. The equilibrium between oxidised and reduced (I) is very much in favour of the former. (I) is reduced by malate, lactate, and  $\beta$ -hydroxybutyrate (II) but the enzymic method never gives complete reduction even when the equilibrium is shifted to the side of reduced (I) by ketone fixatives.  $\alpha$ -Glycerophosphate in the presence of its dehydrogenase, contrary to Euler *et al.* (this vol., 142), does not reduce (I). The presence of a (I) oxidase in pig heart muscle is shown spectrophotometrically. The oxidase is completely inhibited by 0.02M-CN'. Reduced (I) is completely oxidised by MeCHO in the presence of liver mutase, but reduction of oxidised (I) could not be established although its possibility was not excluded. The potential of (I) is about the same as that of the (II) system. The oxidation of reduced (I) by methylene-blue is almost complete. E. A. H. R.

**Co-enzyme linked reactions between dehydrogenase systems.** J. G. DEWAN and D. E. GREEN (Biochem. J., 1937, **31**, 1074—1085).—Co-enzyme I (I) functions as a carrier for the oxidation of  $\beta$ -hydroxybutyrate by fumarate (II), oxaloacetate, (III), pyruvate, acetoacetate, and MeCHO, and for the dismutation of (II) to succinate and (III) in the presence of the appropriate enzymes. All the reactions conform to the mechanism, reductant  $A + (I) + \text{dehydrogenase } A \rightarrow \text{oxidant } A + \text{reduced } (I)$ ; oxidant  $B + \text{reduced } (I) + \text{dehydrogenase } B \rightarrow \text{reductant } B + (I)$ . Manometric methods for the determination of succinic, lactic, and malic acids are described. E. A. H. R.

**Enzymic dehydrogenation of trideuteroacetic acid.**—See A., II, 365.

**Peroxidase systems of plants.** S. HUSZAK (Z. physiol. Chem., 1937, **247**, 239—247).—Peroxidase (I) and catalase (II) [but not ascorbic acid oxidase (III)] are inactivated by 0.001M-NH<sub>2</sub>OH and 0.001M-NHPh-NH<sub>2</sub>. (III) loses activity more rapidly on keeping than do (I) and (II) and is destroyed in 5 min. by heating at 70°, by very low concns. of HCN and H<sub>2</sub>O<sub>2</sub>, and by EtOH, COMe<sub>2</sub>, and Et<sub>2</sub>O. (I) does not accelerate the oxidation of ascorbic acid (IV) by H<sub>2</sub>O<sub>2</sub> but if very low concns. of benzopyran dye containing two phenolic *o*-OH are added oxidation proceeds very rapidly. In mixtures of (II) [in concns. of the same order as those found in plants rich in (II)], (I), dye, 1 mol. of (IV), and 1 mol. of H<sub>2</sub>O<sub>2</sub> 90% of the H<sub>2</sub>O<sub>2</sub> is consumed in oxidising (IV). In fruit juices and pulped vegetable tissues from "peroxidase" plants O<sub>2</sub> with (III) reversibly oxidises 1 mol. of (IV) with production of 1 mol. of H<sub>2</sub>O<sub>2</sub>. H<sub>2</sub>O<sub>2</sub> with (I) then oxidises the dye which likewise reversibly oxidises 1 mol. of (IV). W. McC.

**Peroxidases. II. Determination of the purpurogallic index by a photometric method.** III. Kinetics of the action of horseradish peroxidase with the leuco-base of malachite-green

as substrate. IV. Absence of fluorescence of solutions of horseradish peroxidase in ultra-violet light. V. Determination of peroxidase activity. G. BOSSON (Arch. internat. Physiol., 1937, **44**, 212—215, 219—229, 230—231, 436—443).—II. The colour developed in Willstätter and Stoll's method is measured by means of a Pulfrich photometer.

III. The activity  $\propto$  the concn. of the enzyme and of the substrate. At  $p_H$  3 the activity is checked without the destruction of the enzyme.

IV. The carrier group of peroxidase is dissimilar from that of catalase since fluorescence in ultra-violet light is not obtained (cf. A., 1933, 92).

V. The method depends on the time required for the development of a certain depth of colour in leuco-malachite-green. An arbitrary unit of peroxidase activity is described. H. G. R.

**Influence of monochromatic light on action of yeast catalase.** I, II. R. MURAKAMI (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 429—434, 435—438).—I. More H<sub>2</sub>O<sub>2</sub> is decomposed in yellow than in violet light. The stimulating effect decreases with intensity of light.

II. Using light of the same  $\lambda$ , the decomp. of H<sub>2</sub>O<sub>2</sub> increases with light intensity. J. N. A.

**Plant catalase.** N. T. DELEANO, N. POPOVICI, and I. IONESCO (Bull. Soc. Chim. biol., 1937, **19**, 898—910).—The catalase content of germinating maize, wheat, and oat seedlings increases until the tenth day and then decreases slowly, reaching a const. val. The max. activity occurs at the tip of the stem. A. L.

**Choline-esterase in voluntary frog's muscle.** A. MARNAY and D. NACHMANSOHN (J. Physiol., 1937, **89**, 359—367).—Choline-esterase (I) is determined in muscle by measurement of the rate of anaerobic hydrolysis of acetylcholine. Hydrolysis by chopped frog's muscle is only slightly < by intact muscle. Results are given for hydrolysis by guinea-pig tissues. R. N. C.

**Choline-esterase in invertebrate muscles.** Z. M. BACQ and D. NACHMANSOHN (J. Physiol., 1937, **89**, 368—371).—The rates of hydrolysis of acetylcholine by crustacean, mollusc, and echinoderm muscles are of the same order, whilst that by sea-leech muscle is slightly less. The sphincter muscle of the sea-anemone contains no esterase. The rate of hydrolysis by the brain ganglion of *Eusepia* is 10 times as great as by muscle. R. N. C.

**Choline-esterase in sympathetic ganglia.** F. T. VON BRÜCKE (J. Physiol., 1937, **89**, 429—437).—Choline-esterase in the normal cervical sympathetic ganglion of the cat is > in the normal vagus ganglion or the cervical portion of the sympathetic nerve; it disappears completely on section of the preganglionic fibres. R. N. C.

**Lipase. II.** R. ITOH (J. Biochem. Japan, 1937, **25**, 167—176; cf. A., 1936, 1419).—The hydrolytic action of *Ricinus* lipase is accelerated, and the synthetic action is retarded, by reduced glutathione (I), cysteine, and ascorbic acid, substances which do not reactivate the lipase inactivated by oxidation.

The oxidised activator (A., 1936, 895) is partly reduced by (I). The reduced, but not oxidised, activator forms  $H_2O$ -sol. mol. compounds with cholic acid derivatives. Esterification of various fatty acids and alcohols by the lipase was investigated.

F. O. H.

**Urease.** J. B. SUMNER (J. Chem. Educ., 1937, 14, 255—259).—The history of events leading up to the prep. of cryst. urease is given.

L. S. T.

**New sources of urease for determination of urea.** M. DAMODARAN and P. M. SIVARAMAKRISHNAN (Biochem. J., 1937, 31, 1041—1046).—Jack-bean or soya-bean urease with blood and liver gives abnormally high vals. due probably to the formation of "extra urea" from protein bases present. These errors are greatly increased by increasing the time of reaction or the concn. of enzyme. The seed of the water melon *Citrullus vulgaris* is shown to be a potent source of urease which determines urea quantitatively even in blood and liver.

P. W. C.

**Influence of monochromatic light on the action of soya urease.** II. R. MURAKAMI (Bull. Agric. Chem. Soc. Japan, 1937, 13, 439—443; cf. this vol., 97).—The amount of  $NH_3$  formed from urea increases with the intensity of light of the same  $\lambda$ , but varies inversely as  $\lambda$ .

J. N. A.

**Crystalline urease.** I. M. KITAGAWA and M. FUJII (J. Agric. Chem. Soc. Japan, 1937, 13, 621—628).—Cryst. urease (I) could be obtained from the American "erect" variety of Jack bean, but not from the "twining" variety. Cryst. (I) cannot be obtained from the 31.6%  $COMe_2$  extract of the bean unless the (I) units (i.e., mg. of  $NH_3$ -N produced at  $20^\circ$  in 20 min.) in the extract are  $>58$ . The Jack bean probably contains two kinds of (I), one of which is cryst. and easily sol. in dil.  $COMe_2$  or  $H_2O$ , whilst the other is amorphous and less sol. The ratio of the amounts of the two kinds differs with the origin of the bean.

J. N. A.

**Histozyms.** H. AKIZUKI (J. Biochem. Japan, 1937, 25, 43—59).—Glycerol extracts of pig's kidney contain three "histozymes" which hydrolyse benzoyl-acetic acid (I), -asparagine, and -tyrosine, respectively, are differentiated by their lability to heat, and separated by adsorption on  $MgCO_3$ ,  $CaCO_3$ , etc. or by fractional pptn. Extraction of kidney with 10% aq. sucrose affords only the histozyme hydrolysing (I). The action of the histozymes on  $NH_2$ -acid derivatives and the comparative action of trypsin were determined.

F. O. H.

**Carboxypeptidase.** II. Partial purification of pro-carboxypeptidase. III. Determination of carboxypeptidase and pro-carboxypeptidase. M. L. ANSON (J. Gen. Physiol., 1937, 20, 777—780, 781—786; cf. this vol., 312).—II. Pro-carboxypeptidase (I) is partly purified by fractional pptn. with  $(NH_4)_2SO_4$ . Experiments on activation of the product are described.

III. Carboxypeptidase is determined by  $CH_2O$  titration using either chloroacetyltyrosine or a peptic digest of edestin as substrate. The same method is used for (I) after activation with trypsin.

E. M. W.

**Reaction mechanism of some proteolytic enzymes.** J. WEISS (Chem. and Ind., 1937, 685).—A review suggesting theoretical mechanisms for the action of papain and cathepsin and for that of urease.

R. M. M. O.

**Secretion of proteases by gelatin-liquefying bacteria.** A. I. VIRTANEN and O. SUOLAHTI (Enzymologia, 1937, 2, 89—91).—The protease of gelatin-liquefying bacteria is excreted by the living cells. After 10 hr. growth the protease of *B. fluorescens liquefaciens* is found almost entirely in the medium, none being present in the cells (cf. Gorbach and Pirch, this vol., 68).

E. A. H. R.

**Action of enzyme extracts on soluble keratin.** II. Papain type. P. G. CASTELLINO (Arch. Ist. Biochim. Ital., 1937, 9, 171—174; cf. A., 1936, 379).—Preps. of autolysed guinea-pig's skin (in presence or absence of NaSH or KCN) or of psoriatic crusts (man) have no action on caseinogen or sol. keratin in  $PO_4'''$  buffer at  $pH$  7.4.

F. O. H.

**Koji amylase.** IX.  $\beta$ -Amylase in koji. Y. TOKUOKA (J. Agric. Chem. Soc. Japan, 1937, 13, 586—594; cf. this vol., 67).—An improved prep. of  $\alpha$ -amylase from koji is described. If koji is ground with  $H_2O$ , and EtOH added to 50%, then 75% EtOH ppts. from the filtrate an enzyme prep. which contains no  $\alpha$ -amylase but hydrolyses starch. A solution of  $\beta$ -amylase is also obtained by elution of the adsorbed enzymes on koji residues with 1% NaCl.

J. N. A.

**Production of glucosone from carbohydrates by enzymic action.** C. R. BOND, E. C. KNIGHT, and T. K. WALKER (Biochem. J., 1937, 31, 1033—1040).—Cultures of *Aspergillus parasiticus*, Speare, and of an unnamed species belonging to the *A. flavus-oryzae* group after plasmolysis by PhMe, PhBr, or  $CHCl_3$  converted glucose (I) in dil. aq. solution into glucosone (II). The optimum conditions are 1.5% PhMe, 0.5—1% (I), temp.  $30^\circ$ ,  $pH$  6, and time of incubation 4—6 days. Starch, maltose, and sucrose gave better yields of (II) than did (I).

P. W. C.

**Pyruvic acid dehydrogenation, vitamin- $B_1$ , and cocarboxylase.** F. LIPMANN (Nature, 1937, 140, 25).—Addition of cocarboxylase to  $COMe_2$ -treated lactic acid bacteria, which had thereby lost the ability to dehydrogenate  $AcCO_2H$ , restores their power of oxidation. The addition of vitamin- $B_1$  was without effect, but the addition of a prep. of flavin phosphate from heart with the cocarboxylase gave an increased activation.  $PO_4'''$  is essential to the dehydrogenation.

L. S. T.

**Synthesis of cocarboxylase from vitamin- $B_1$ .** K. G. STERN and J. W. HOFER (Science, 1937, 85, 483—484).—When treated in the cold with  $POCl_3$ , synthetic cryst. vitamin- $B_1$  yields (1.5%) a compound that exhibits the properties of cocarboxylase (I). The results support the finding of Lohmann and Schuster (this vol., 97) that (I) represents a diphosphoric ester of  $-B_1$ .

L. S. T.

**Crystallisation of lysozyme.** E. P. ABRAHAM and R. ROBINSON (Nature, 1937, 140, 24).—A photomicrograph of dodecahedra (?) of lysozyme,

mol. wt. (provisional) approx. 18,000, is reproduced. The ultra-violet absorption spectrum indicates the presence of 4.4% of tyrosine and 2.2% of tryptophan residues in the mol. L. S. T.

**Influence of respiration on the permeability of the yeast cell to fluoride.** J. RUNNSTROM, A. RUNNSTROM, and E. SPERBER (Naturwiss., 1937, 25, 474).—The surface of respiring yeast cells is not or only slightly permeable to F' but becomes permeable when the respiration is depressed by washing, anaerobic conditions, etc. Permeability to F' under aerobic conditions is with beer yeast  $\gg$  with baker's yeast. P. W. C.

**Factor-Z in wheat flour.** R. GEOFFROY and G. LABOUR (Bull. Soc. Chim. biol., 1937, 19, 922—930).—The increased rate of fermentation of wheat extracts by yeast observed after 4 hr. also occurs when the extracts are treated with animal C, phosphotungstic acid, or colloidal Fe, or extracted with EtOH to remove any factor-Z (cf. Borchardt and Pringsheim, A., 1934, 1035) which may be present. The activation is due to the multiplication of the yeast cells. A. L.

**Property of vegetable cells of excreting neutral-red after accumulating it in their vacuoles.** A. GUILLERMOND and R. GAUTHERET (Compt. rend., 1937, 204, 1520—1523).—*Saccharomyces ellipsoideus* takes up neutral-red (I) at  $p_H$  8.2 (cf. this vol., 334) and voids it in 2.5 hr. Springer's yeast reacts similarly. At  $p_H$  5 there is an initial large decrease in the concn. of (I) due to adsorption on the intercellular membranes; this effect is smaller at  $p_H > 5$  and the mortality amongst the cells is lower. J. L. D.

**Fermentation of glucose by yeast.** R. GUILLEMET and H. LEROUX (Compt. rend. Soc. Biol., 1937, 125, 903—905).—The secondary products of fermentation bear an inverse relationship to the quantity of yeast employed. H. G. R.

**Fermentation products of *S* and *R* forms of yeasts.** F. W. FABIAN and L. J. WICKERHAM (J. Bact., 1936, 31, 31—32).—*S* forms of *Saccharomyces cerevisiae*, *S. uvarum*, *S. pastorianus*, *Pichia alcoholophila*, and *Willia anomala* produced EtOH more quickly and in larger amounts than did the *R* forms. Production of volatile acids was very variable according to species, form, and medium. Ester production fluctuated less and was in general greatest when the  $O_2$  supply was sufficient to maintain normal growth. Esters are probably produced within the cells during fermentation and not by endoenzymic or chemical combination of the alcohol and acids appearing in the substrate. Interconversion of *S* and *R* forms is influenced by the medium used. A. G. P.

**Mechanism of the action of the several cytochrome components in cell respiration.** H. TAMURA and Y. OGURA (Acta Phytochim., 1937, 9, 123—158).—Under kinetic-stationary conditions (continuous passage of a gas mixture of defined  $O_2$  content) the oxidised and reduced forms of the individual cytochrome components in yeast cells are invariably present in the relationship: reduced *b* component/oxidised *b* component  $>$  reduced *a*/oxidised *a* com-

ponent  $>$  reduced *c*/oxidised *c* component; this is true also in the presence of varied amounts of HCN. The ratio, reduced form/oxidised form, of the individual cytochrome components increases with diminution of the ratio, amounts of  $O_2$ /dehydrogenase activity, or with increase in amount of added HCN until finally all cytochrome components are practically reduced. Observations recorded indicate that in the mechanism of cell respiration the three cytochrome components are not directly or indirectly oxidised by  $O_2$  or reduced by the dehydrogenase system independently of one another. Cytochrome-*c* has the highest and -*b* the lowest normal redox potential. The mechanism of yeast respiration is therefore,  $O_2 \xrightarrow{\text{O}_2\text{-transporting enzyme}} \text{indophenol oxidase} \rightarrow c \xrightarrow{a} b \rightarrow \text{dehydrogenase system}$ , which explains satisfactorily all oxido-reductive phenomena of the cytochrome components. The oxido-reductive function of *a* can be restricted by various chemically inert, surface-active substances so that with continuous aeration *c* can be stabilised in the oxidised and *b* in the reduced condition. The above theory explains the dependence of the various cytochrome types of micro-organisms on the  $O_2$  requirement. H. W.

**First phase of fermentation by yeast.** R. WILLSTATTER and M. ROHDEWALD (Z. physiol. Chem., 1937, 247, 269—280; cf. this vol., 247).—In the first stage of the fermentation of glucose (I) and maltose (II) by yeast, before evolution of  $CO_2$  begins [6—8 min. for (I), 6—15 min. for (II)], the sugar which disappears is quantitatively or almost quantitatively converted into glycogen, which subsequently undergoes degradation. Hence (I) and (II) (and possibly other fermentable sugars also) are not directly fermentable and the first stage of fermentation is not a phosphorylation. W. McC.

**Temperature coefficient of velocity of alcoholic fermentation.** J. V. MEDVEDEV (Biochimia, 1937, 2, 514—520).—The energy of activation *E* falls gradually, and the temp. coeff. *Q* of the reaction of alcoholic fermentation by live yeast more rapidly, with rising temp. from 5° to 40°; experimental vals. of *Q* agree with those calc. from 4.55 log  $Q = 10E/T + (E_1 - E_2)/T^2$ , where  $E_1$  and  $E_2$  represent *E* at temp.  $T_1$  and  $T_2$  and *E* and *T* are the mean vals. for a given temp. range. R. T.

**Beha moisture meter [for yeast etc.].**—See A., I, 480.

**Production of vitamin-C-like reducing substances by mould fungi.** J. FUKUMOTO and H. SHIMOMURA (J. Agric. Chem. Soc. Japan, 1937, 13, 613—620).—*Aspergillus cellulosa*, *A. fumigatus*, *A. niger*, *A. nidulans*, *A. melleus*, *Penicillium glaucum*, and *P. luteum* all produce substances which reduce 2:6-dichlorophenol-indophenol and I. None had any physiological effect like that of vitamin-C. J. N. A.

**Physiological and biochemical investigations of *Aspergillus itaconicus*.** II. K. KINOSHITA (Acta Phytochim., 1937, 9, 159—187; cf. A., 1932, 92).—The organism grows badly in the customary media but freely in those containing 20—30% of

sugar or 2*N*-KCl. It flourishes moderately in 4*N*-KCl. The depression of the f.p. of the expressed juice of the mycelium grown in solutions of high concn. is invariably great but the osmotic coeff. (osmotic pressure of the juice/osmotic pressure of the external medium) is  $\ll 1$ . Possible reasons for this discrepancy are discussed. Mycelium grown in solutions of high concn. shows a change of form, notably thickening of the hyphae, and the production of a hemicellulose-like material at the outer membrane layers. Mycelium grown in highly conc. KCl is never adapted to excessive K adsorption. In media containing KNO<sub>3</sub> as N source adsorption of K is parallel with resorption of NO<sub>3</sub>'. H. W.

**Molecular constitution of terrein, a metabolic product of *Aspergillus terreus*, Thom.**—See A., II, 379.

**Molecular constitution of geodin and erdin, metabolic products of *Aspergillus terreus*, Thom.**—See A., II, 385.

**Sclerotial formation in *Rhizoetonia solani* as affected by nutritional and other factors.** W. B. ALLINGTON (Phytopath., 1936, 26, 831—844).—Sclerotia formed most readily in low-carbohydrate-high-N media, and their production was favoured by different N sources in the descending order, Ca(NO<sub>3</sub>)<sub>2</sub>, asparagine, NH<sub>4</sub>NO<sub>3</sub>, urea, NaNO<sub>3</sub>. No differences in sclerotial development were observed with glucose, sucrose, or potato starch as C sources. Glycerol and lactic acid were not readily utilised by the fungus. *R. solani* caused changes in the  $p_H$  of media, the nature of which was influenced by the N source. Growth and formation of sclerotia were favoured by  $p_H$  7.0 (approx.). The organism tolerated acid but not alkaline conditions. A. G. P.

**Root nodule bacteria of leguminous plants. XIX. Influence of various factors on excretion of nitrogenous compounds from the nodules.** A. I. VIRTANEN, S. VON HAUSEN, and T. LAINE (J. Agric. Sci., 1937, 27, 332—348; cf. A., 1936, 640).—Excretion of NH<sub>2</sub>-N does not occur in uninoculated legume roots growing in an NO<sub>3</sub>' medium. Further evidence is advanced favouring the view that NH<sub>2</sub>-acids excreted from inoculated roots are derived from N fixed by nodule bacteria and not from the breakdown of plant protein. Excretion is observed in media (cellulose, kaolin, soil) capable of absorbing the acids and is less readily detected in aq. media. The % of the fixed N which is excreted varies with the strain of nodule organism, with the quantity of nutrient available, and with the amount of sand used in the culture. The air content of the medium affects the amount of N fixed but not the proportion of this which is excreted. A. G. P.

**Factors controlling pigment production by *Mycobacterium phlei*.** M. A. INGRAHAM (J. Bact., 1936, 31, 18—19).—The organism may contain ten carotenoid pigments, including  $\alpha$ - and  $\beta$ -carotene, kryptoxanthene and esters of lutein, zeaxanthene, and azafrin. On a glucose-asparagine medium pigmentation is small but is markedly increased by addition of simple alcohols, glycols, or glycerol. In

the absence of these supplements cells remained white under alkaline ( $p_H > 8.0$ ) conditions. Excessive proportions of K, PO<sub>4</sub>', Cu'', or Fe<sup>III</sup> restricted accumulation of pigment. Cu'' and Fe<sup>III</sup> were quantitatively adsorbed on the surface of the cells.

A. G. P.

**Lipins of acid-fast soil bacilli.** H. KAMEDA (J. Biochem. Japan, 1937, 25, 113—131).—Data for the contents of lipin-P and -N, differentiated by their solubility in light petroleum, Et<sub>2</sub>O, and EtOH, in a strain of acid-fast soil bacilli grown in a glycerol-containing medium, at various periods are tabulated. In the petrol-sol. fraction the N:P ratio tends to increase with growth whilst in the EtOH-sol. fraction the ratio tends to remain const. The data are compared with those for other types of bacilli.

F. O. H.

**Identity of "*Bacterium X*" (Brown) and "*Bacterium C*" (Chapman).** J. L. SHIMWELL and W. F. KIRKPATRICK (J. Inst. Brew., 1937, 43, 339—342).—Cultures of these organisms examined probably represent strains of *Bacillus cereus*, Frankland, and are distinguished as var. *arborescens* and var. *rubicundus*, respectively. It is unlikely that the "*Bacterium X*" now employed in determination of hop antiseptic val. is identical with that originally employed by Brown. The characters of the two strains and of *B. cereus* are described. I. A. P.

**Metabolism of the purple bacteria. I. Photosynthesis in the sulphur-free, purple bacterium, *Rhodobacillus palustris*. II. Carbon dioxide assimilation of *R. giganteum*.** H. NAKAMURA (Acta Phytochim., 1937, 9, 189—229, 231—234).—I. In the presence of O<sub>2</sub>, *R. palustris* develops in light or in darkness whilst in its absence development occurs only in light. Absorption of O<sub>2</sub> during aerobic respiration is greatly hindered by irradiation and the effect is increased by CO<sub>3</sub>'; in some cases a small positive O<sub>2</sub> pressure is observed. It appears, therefore, that *Rhodobacillus* produces in light an assimilation product (I) which is immediately consumed by O<sub>2</sub> respiration. The latter is essential for growth so that this does not occur in the dark in the absence of O<sub>2</sub>. The amount of (I) produced is < that of the O<sub>2</sub> required for respiration, and O<sub>2</sub> production in assimilation represents merely a diminution of the O<sub>2</sub> consumption. Illumination also increases the time required for the decolorisation of methylene-blue. Under aerobic conditions the organism reduces CO<sub>2</sub> with aid of mol. H<sub>2</sub>. Infra-red light, notably the rays of shorter  $\lambda$ , is utilised in the assimilation of CO<sub>2</sub>. Separation of O<sub>2</sub> during assimilation is prevented by addition of 0.0005*M*-NH<sub>2</sub>OH whereas respiration is not restricted. *Rhodobacillus* contains considerable amounts of catalase which is restricted by NH<sub>2</sub>OH. Catalase participates in the photosynthesis (in absence of H<sub>2</sub>S or fatty acids) and causes evolution of O<sub>2</sub> by fission of H<sub>2</sub>O<sub>2</sub>. HCN and NH<sub>2</sub>·CO<sub>2</sub>Ph restrict assimilation and respiration whilst pyrogallol, pyrogallol-*o*-carboxylic acid, and gallic acid inhibit only assimilation. CO is without action on either process. Peptone and the lower fatty acids are the most suitable substrates for respiration. Addition of H<sub>2</sub>S or fatty acids modifies

the assimilation processes of *R. palustris* since, in place of  $O_2$ , S or oxidation products of the acids are formed in amount dependent on the  $CO_2$  reduction. The organism contains dehydrogenases sp. towards the lower fatty acids. In presence of  $H_2S$  or fatty acids, reduction of  $CO_2$  occurs through H atoms from  $H_2O$  and the residual OH reacts as such (or after combination to  $H_2O_2$ ) with  $H_2S$  or with the H atoms formed by dehydrogenation of the fatty acids. *R. palustris* contains also hydrogenases which render mol.  $H_2$  available for the reduction of methylene-blue,  $NO_3^-$ , or other acceptors, and which reduce OH radicals (or  $H_2O_2$ ) to  $H_2O$  with aid of mol.  $H_2$ , thus explaining the  $CO_2$  assimilation with consumption of H gas. Thiorhodaceæ and Anthorhodaceæ can be cultivated in org. media free from  $H_2S$  when the cells accumulate S granules. Differences between the two types of purple bacteria are not abs. and their apparent forms probably depend on the particular chemical conditions of their origin. The primary photochemical reaction in the  $CO_2$  assimilation of purple bacteria is identical with that of green plants since  $H_2O$  mols. function as H donors to the  $CO_2$  reduction.  $H_2S$  and fatty acids are involved only in the subsequent changes. High vals. are observed for the sp. photochemical action in the photosynthesis of the bacteria in the infra-red. The reduction of each mol. of  $CO_2$  probably requires four light quanta.

II. Peptone, sucrose, glycerol, lactate, formate, acetate, propionate, and butyrate are suitable sources of C for heterotrophic culture.  $S_2O_3^{2-}$ , in presence of such org. substances (particularly fatty acids), causes marked acceleration of development.  $H_2S$  or other oxidisable S compound is essential for autotrophic culture. In light and in presence of fatty acids *Rhodospirillum* causes distinct  $CO_2$  assimilation which is considerably increased by  $S_2O_3^{2-}$ . In light in the sole presence of  $H_2S$  or  $S_2O_3^{2-}$  the organism is able to reduce  $CO_2$  at the expense of the S compounds. The metabolism of *Rhodospirillum* is therefore identical with that of *Rhodobacillus* with the exception that the latter can only utilise  $H_2S$  and other S compounds after a considerable period of acclimatisation. The mechanism of the assimilative metabolism is similar. H. W.

Oxidation-reduction potentials of certain anaerobic and facultative anaerobic bacteria. I.  $E_h : p_H$  relationship; double reversion of potential during the apparent logarithmic phase. II. Differentiation of *Lactobacilli* of intestinal and buccal origin. R. W. H. GILLESPIE and L. F. RETTGER (J. Bact., 1936, 31, 14—15).—I. Changes in reduction potential with difference in  $p_H$  of cultures of *Lactobacilli* in unbuffered media are examined. Reversion of  $E_h$  during the development of the organisms occurs at the period of most rapid change of  $p_H$ . The final  $p_H$  of cultures of various organisms differed for different strains.

II. In buffered low-carbohydrate media different strains of *Lactobacilli* caused little change in  $p_H$ , but the final reduction intensity of oral and intestinal strains diverged sufficiently to permit differentiation by means of indicators. A. G. P.

Phosphoglyceric acid in the dissimilation of glucose by *Citrobacter freundii*. C. H. WERKMAN, E. A. ZOELLNER, H. GILMAN, and H. REYNOLDS (J. Bact., 1936, 31, 5).—Phosphoglyceric acid occurs amongst the intermediate products of the dissimilation of glucose; it is converted by *C. freundii* into  $AcCO_2H$ . A. G. P.

Aerobic dissimilation of lactic acid by propionic acid bacteria. H. G. WOOD, C. ERB, and C. H. WERKMAN (J. Bact., 1936, 31, 5—6).—At  $30^\circ$  and  $p_H$  6.0 non-proliferating *Propionibacterium arabinosum* converts lactic acid into  $AcCO_2H$  (I),  $AcOH$ ,  $EtCO_2H$  (II), and  $CO_2$ . (I) is probably an intermediate in the dissimilation of (II). A. G. P.

Biolysis, or fission of gelatin by pure cultures of living bacteria. V. S. SADIKOV and E. L. REMENNIKOVA (Biochimia, 1937, 2, 549—558).—12—43-day cultures of *B. proteus* in 5% gelatin (I) are passed through Berkefeld or Chamberland filters, and broth, broth-peptone-(I), or (I) media are inoculated with the filtrates. Pure cultures of *B. proteus* are thus obtained after the lapse of a latent period (10—34 days), showing that transformation of the bacteria into an ultrafilterable form takes place in gelatin (but not other) cultures. The  $NH_2$ -acid-N of (I) cultures is at a max. in 6- and of  $NH_3$ -N in 8-month cultures. The  $NH_3$ -N of sterile (I) hydrolysates does not vary with time, whilst the  $NH_2$ -acid-N rises continuously during 8 months at  $37^\circ$ .

R. T.  
Occurrence and biological production of l(—)-glutamic acid. V. BRUCKNER and G. IVANOVICS (Z. physiol. Chem., 1937, 247, 281—284; cf. this vol., 250).—*Bacillus mesentericus* (and certain other bacilli), propagated in a medium containing l-asparagine or d-glutamic acid as N source, produces a polypeptide-like substance which gives a difficultly sol. Cu salt hydrolysed by HCl with production of good yields of l(—)-glutamic acid. W. McC.

Formation of 7-hydroxy-3:12-diketocholanic acid from dehydrocholic acid by *B. coli communis*. T. FUKUI (J. Biochem. Japan, 1937, 25, 61—69).—The above conversion occurs with cultures at  $37$ — $38^\circ$  in 6 months. F. O. H.

Hydrogen sulphide production as a differential test in the colon group. R. VAUGHN and M. LEVINE (J. Bact., 1936, 31, 24).—The concn. of agar used in media markedly influences  $H_2S$  production by different strains of the organism. All strains give positive results in presence of cysteine. The concn. of peptone is not a significant factor. A. G. P.

Fermentation of acetylmethylcarbinol by the *Escherichia*-*Aërobacter* group and its significance in the Voges-Proskauer reaction. R. P. TITSLER (J. Bact., 1936, 31, 21).—Failure to obtain positive Voges-Proskauer tests in old cultures of *A. aerogenes* and *A. oxytoca* is due to actual fermentation of  $CH_3AcMeOH$ . A. G. P.

Effect of minimal amounts of heterobacteria on the degree of fever induced by influenza bacillus. S. NUKADA and T. YOSHII (Arch. exp. Path. Pharm., 1937, 185, 178—183).—Injection of dead influenza bacillus into rabbits subsequent to

an injection of min. amounts of typhus or proteus did not result in fever; subsequent to pyocyaneus or paratyphosus *A* and *B* led to no or only slight fever; after pneumococcus or staphylococcus showed slightly higher rise in temp. than did normal rabbits; after meningococcus, gonococcus, and Shiga bacillus showed as great or greater temp. rise than did normal rabbits; after streptococcus, coli, cholera vibrios, etc. showed a rise of temp. identical with that of normal animals. The action of *B. proteus* in depressing the fever is still considerable 24 and even 48 hr. after injection but disappears 96 hr. after injection. P. W. C.

**Lipins of tubercle bacilli. XLVIII.** Phthiocerol in the wax from strains of human tubercle bacillus. **XLIX.** Colorimetric determination of phthiocol. R. E. REEVES and R. J. ANDERSON. **L.** Phthiocerol in the wax of bovine tubercle bacillus. J. CASON and R. J. ANDERSON (J. Biol. Chem., 1937, 119, 535—541, 543—547, 549—551; cf. this vol., 318).—**XLVIII.** The wax of four recently isolated strains of the bacillus contains phthiocerol (I) (isolated by a simplified procedure), a  $H_2O$ -sol. carbohydrate, and small amounts of glycerol.

**XLIX.** Phthiocol, which is present in the wax of three of the strains, yields a red colour with dil. aq.  $NaHCO_3$  and is determined colorimetrically ( $\leq 0.4$  mg.; error  $\pm 5\%$ ) or with a spectrophotometer ( $\leq 0.05$  mg.).

**L.** (I) occurs in the wax of the bovine bacillus. The carbohydrate of this wax differs from that of the wax of the human bacillus. W. McC.

**Chemical composition of the active principle of tuberculin. XX.** Comparative yield, potency, specificity, and acid-base-combining capacity of proteins from five human tubercle bacilli culture filtrates and other acid-fast bacilli. F. B. SEIBERT (J. Amer. Chem. Soc., 1937, 59, 958—963; cf. A., 1936, 1403).—Five strains of human tubercle bacilli gave similar (0.2 g. per litre of culture) yields of protein, four of which had 14% and one 15% of N, but all were similar in potency and in acid-base-combining capacity at  $p_H$  2—11 (determined by electrometric titration) and behaved identically in the precipitin test. They are readily distinguished from proteins of other acid-fast bacilli. R. S. C.

**Relation of certain respiratory enzymes to the maximum growth temperatures of bacteria.** O. F. EDWARDS and L. F. RETTGER (J. Bact., 1936, 31, 12—14).—The presence of a thermostable peroxidase, an indophenol-oxidase, and a succino-dehydrogenase is demonstrated in numerous species of bacilli. Max. and min. temp. of growth of the organisms are correlated with the temp. of destruction of the enzymes. A. G. P.

**Protein-sparing action of carbohydrates in relation to anaerobic identification.** R. S. SPRAY and A. R. STANLEY (J. Bact., 1936, 31, 27).—Evidence is obtained supporting the hypothesis of the "protein-sparing" effect of fermentable carbohydrates. A. G. P.

**Activity of bacteriophage in lactic streptococci.** H. R. WHITEHEAD and G. J. E. HUNTER (J. Path.

Bact., 1937, 44, 337—347).—Under certain conditions of growth in milk phages arise spontaneously. From each streptococcal type a series of resistant cultures and secondary phages can be obtained. Phages are probably products of the organism.

W. L. D.

**Isolation of a crystalline protein possessing the properties of aucuba mosaic virus.** W. M. STANLEY (J. Bact., 1936, 31, 52—53).—The method of isolation and general character of the product are described (cf. A., 1935, 1181).

A. G. P.

**Virus molecules.** J. G. BALD (J. Austral. Inst. Agric. Sci., 1937, 3, 93—96).—A review.

A. G. P.

**Aggregation of virus particles.** J. G. BALD and G. E. BRIGGS (Nature, 1937, 140, 111).—Dilution-infection data indicate that virus particles of the tobacco mosaic group, even in dil. solution, may form end-to-end chain aggregates (cf. this vol., 228).

L. S. T.

**Determination of the relative concentrations of the viruses of the ordinary and yellow tobacco mosaics and of tomato spotted wilt by the primary lesion method.** R. J. BEST (Austral. J. Exp. Biol., 1937, 15, 65—79).—The limiting frequency of lesions obtained with conc. preps. depends on technique and conditions but the decrease associated with dilution, plotted as a dilution curve, follows in all cases a regular though complex course, which can be used for determination in a region in which dilution approx.  $\propto$  no. of lesions.

R. M. M. O.

**Serological tests with Stanley's crystalline tobacco-mosaic protein.** K. S. CHESTER (Phytopath., 1936, 26, 715—734).—Several viruses examined (including tobacco mosaic) gave no anaphylactic reaction but proteins of healthy tobacco plants gave strong reactions. Proteins of healthy tobacco and tomato plants were serologically similar. Cross-reactions between healthy plant proteins and the cryst. mosaic protein are ascribed to contamination of the latter with protein serologically allied to or identical with the healthy protein. Precipitin reactions of sera of sensitised guinea-pigs show differences in the mechanism of the action of healthy and mosaic proteins although the same antibody may be concerned in both.

A. G. P.

**Separation and analysis of virus strains by means of precipitin tests.** K. S. CHESTER (Phytopath., 1936, 26, 778—785).—Serological differences are demonstrated among strains of tobacco-mosaic virus.

A. G. P.

**Liberation of neutralised virus and antibody from anti-serum-virus precipitates.** K. S. CHESTER (Phytopath., 1936, 26, 949—964).—Virus-immune serum from which antibodies for healthy tobacco protein had been removed was purified by elimination of proteins insol. in 30% and those sol. in 43% saturated  $(NH_4)_2SO_4$ . Pseudoglobulins rendered insol. in  $H_2O$  by heating to  $57^\circ$  were also removed. The resulting liquid after dialysis had an almost undiminished virus-antibody content but a much lower non-sp. inhibitory action. The inhibitory property of normal serum is distributed

among all protein fractions. Neutralised mixtures of mosaic virus juice and immune serum obtained by titration, coupled with precipitin tests, contained no free virus or serum, as shown by chemical, physical, and serological tests, but on digestion with pepsin showed destruction of antibodies, partial retention of virus, and increased infectivity. Similar partial digestion of virus-free immune serum yielded no infective material. Acidification ( $p_H$  4.8) of neutral ppts. of potato "X" virus with its sp. serum causes dissolution of the ppt. and the appearance of free antibody in the supernatant liquid. A unit of the antibody combines with and is saturated by any no. of units of antigen from 1 to 8. A. G. P.

**Kinetics of formaldehyde disinfection of vaccinia virus.** E. V. KEOGH (Austral. J. Exp. Biol., 1937, **15**, 109—112).—A logarithmic law similar to that for bacteria is maintained within the range of experimental accuracy. R. M. M. O.

**Bactericidal and destructive effects of Dakin's solution on tubercle bacilli.** B. H. Y. T'ANG (Chinese Med. J., 1937, **52**, 77—84). L. D. G.

**Effectiveness of hot hypochlorites of low alkalinity in destroying *Mycobacterium tuberculosis*.** S. M. COSTIGAN, J. W. YATES, W. A. HADFIELD, and E. C. McCULLOCH (J. Bact., 1936, **31**, 6).—Lethal concns. are examined in relation to temp. and to speed of killing the organisms. A. G. P.

**Evaluation of mercurial antiseptics in the presence of serum.** D. E. SMITH and E. J. CZARNETZKY (J. Bact., 1936, **31**, 7—8).—Metaphen, merthiolate, mercurochrome, and  $HgCl_2$  combine with serum-proteins to form non-antiseptic compounds. A. G. P.

**Effect of sodium selenite on growth of bacteria and its use as a basis for enrichment media for isolation of typhoid bacilli from faeces, water, milk, etc.** E. LEIFSON (J. Bact., 1936, **31**, 26—27).—Differential inhibitory effects of  $Na_2SeO_3$  on the growth of various species are examined. Typhoid and dysentery bacilli are relatively resistant and may be separated by this means. A. G. P.

**Antistreptococcal action of organic sulphides.** E. FOURNEAU, J. TRÉFOUEL, F. NITTI, D. BOVET, and (MME.) J. TRÉFOUEL (Compt. rend., 1937, **204**, 1763—1766).—4 : 4'-Di- and 2 : 4 : 2' : 4'-tetra-nitrodiphenyl sulphide protect mice against streptococcal infection which, in controls, is fatal in 24 hr., but are only 0.25 times as active as  $p-NH_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$  (I) (cf. this vol., 99). 4 : 4'-Dinitrodiphenyl disulphide is 4—8, and the -sulphone 10 times, as active as (I);  $Ph_2S_2$  and 2 : 2'-dinitrodiphenyl disulphide are inactive. J. L. D.

**Sterilising action of acids. VIII. Relation-ship between stereochemical constitution of fatty acids and physiology of bacteria. I. Isomeric *cis-trans* acids. II. Optically active acid isomerides.** S. TETSUMOTO (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 369—382, 458—466).—I. The sterilising action of *cis*-fatty acids on bacteria is > that of the *trans*-acids.

II. The action of optically active acids is > that

of the inactive acids. Salts of *dl*-lactic, *dl*-malic, *dl*- and *meso*-tartaric acids have approx. the same action. J. N. A.

**Bactericidal action of mixtures of phenol and merthiolate.** C. R. FALK and S. APPLINGTON (J. Bact., 1936, **31**, 8—9).—The action of mixtures of varying composition on a no. of pathogenic organisms is examined at different temp. A selective action of the individual preservatives is recorded. A. G. P.

**Action of phenolic substances on bacteria. Influence of chemical constitution. Effect of salicylic acid, salicylaldehyde, and saligenin and their mono- and di-halogen derivatives.** P. DELAUNEY (J. Pharm. Chim., 1937, [viii], **25**, 545—560; cf. this vol., 183).—Using *Staphylococcus pyogenes aureus* and *B. subtilis* the bacteriostatic activities of  $o-OH \cdot C_6H_4 \cdot CO_2H$  and its halogen derivatives are distinctly < that of  $PhOH$  (I), except in the case of the 3 : 5- $I_2$ -acid, which is twice as active to *S. pyogenes aureus* and three times as active to *B. subtilis*. The activity of the halogenated aldehydes is in the order  $Cl < Br < I$ , and they are all 10—40 times as active as (I). The alcohols are all more active than (I), the Br-derivatives having greatest activity. In their bactericidal action, using the "direct" method, none of the compounds completely destroyed *B. subtilis*. With the "centrifugal" method, the  $Br_2$ - and  $I_2$ -acids were more active than (I), the aldehydes did not give reliable results, and the alcohols were more active except in the case of  $o-OH \cdot C_6H_4 \cdot CH_2 \cdot OH$  and its 5-Cl-derivative. All the substances were dissolved in 1 mol. of NaOH. J. N. A.

**Bactericidal properties of certain plant juices.** J. M. SHERMAN and H. M. HODGE (J. Bact., 1936, **31**, 96).—Expressed juices of cabbage heads and turnip roots contain a mildly germicidal substance which is destroyed by heating at 60° for 10 min., is separated by a Berkefeld N filter but not by a V candle, and is adsorbed by activated C. A. G. P.

**Preparation and properties of silicic acid jellies for pure culture isolation of bacteria.** J. H. HANKS and R. W. WEINTRAUB (J. Bact., 1936, **31**, 29—30).—Standard conditions of prep. are ensured by mixing appropriate indicators with 6% aq. Na silicate and 0.5N-HCl and mixing these in proportions to produce the desired  $p_H$ . Changes of  $p_H$  during dialysis and autoclaving, and effects on these of time, temp., etc., are examined. Gels prepared with  $NH_4$  salts showed relatively small fluctuations in  $p_H$ . A. G. P.

**Effect of certain hormones on the activity of the uterine muscle of the guinea-pig.** G. H. BELL and J. M. ROBSON (J. Physiol., 1937, **88**, 312—327). R. N. C.

**Effect of adrenaline on muscle-glycogen in adrenalectomised, thyroidectomised, and hypophysectomised rats.** J. B. COLLIP, D. L. THOMSON, and G. TOBY (J. Physiol., 1936, **88**, 191—198).—Adrenaline causes a reduction of muscle-glycogen (I) in adrenalectomised animals > in normal animals without producing hyperglycæmia. In thyroidectomised animals hyperglycæmia appears without appreciable reduction of (I), whilst in hypophys-

ectomised animals, whether or not fed with desiccated thyroid, neither (I) mobilisation nor hyperglycaemia occurs, unless the animals are previously treated with anterior pituitary extract. R. N. C.

**Adrenaline and the blood-lactic acid level in hypophysectomised rabbits.** O. COPE and R. H. THOMPSON (J. Physiol., 1937, 88, 417—424).—Complete hypophysectomy does not alter significantly the rise of blood-lactate (I) induced by subcutaneous injection of adrenaline (II), which is hence still able to cause breakdown of muscle-glycogen. Hypophysectomised animals fasted until the blood-sugar is <40 mg. per 100 c.c. show no significant increase of (I), so that the amount of (II) released into the circulation in response to the hypoglycaemia must be negligible. R. N. C.

**Action of adrenaline on the knee-jerk.** A. SCHWEITZER and S. WRIGHT (J. Physiol., 1937, 88, 476—491). R. N. C.

**Relationship between the blood-calcium level and the effect of intravenous injections of adrenaline in the dog.** F. DWELSHAUVERS (Arch. internat. Physiol., 1937, 44, 313—328).—The hypotensive and vasoconstrictive activities of adrenaline are augmented by high blood-Ca (I) and the presence of parathormone in the blood, but during the period of activity (I) is diminished. H. G. R.

**Central nervous origin of post-insulin hyperadrenalinæmia.** J. LA BARRE and R. SARIC (Arch. internat. Physiol., 1937, 44, 459—473).—The adrenaline (I) content of dog's adrenal venous blood can be increased by perfusion of the encephalic nervous centres with the blood of another animal rendered hypoglycaemic by insulin treatment. This discharge of (I) is rapidly decreased if the blood-sugar of the perfusing blood is increased by prior injection of glucose. H. G. R.

**Disappearance of injected adrenaline in the animal body.** S. S. WEINSTEIN and R. J. MANNING (Science, 1937, 86, 19—20).—Adrenaline is not destroyed by the blood nor to any significant extent by sp. organs. It probably passes rapidly through the capillaries into the tissues, where it is oxidised to a physiologically inactive substance, possibly protocatechuic acid. L. S. T.

**Value of extracts of adrenal cortex in the treatment of Addison's disease.** J. F. WILKINSON (Lancet, 1937, 233, 61—70).—These extracts (cortin and eucortone) are of val. High blood-urea quickly returns to normal with a simultaneous disappearance of albumin from the urine; blood-Na<sup>+</sup>, -Cl<sup>-</sup>, and -PO<sub>4</sub><sup>'''</sup> return to normal. The extracts have no effect on the hypochromic microcytic anaemia frequently present, and the basal metabolic rate is also unaltered. L. S. T.

**Standardisation of cortical extracts by the use of drakes.** E. BULBRING (J. Physiol., 1937, 89, 64—80). R. N. C.

**Cholesterol and the adrenal cortical hormone.** O. ROSENHEIM and H. KING (Nature, 1937, 139, 1015).—Mild oxidation of the 3-acetate (or -benzoate) of *cis*-Δ<sup>5</sup> 6-cholestene-3:4-diol (I) yields (?) the

oxide of 4-ketocholestenol 3-acetate (or -benzoate), hydrolysed to a highly reactive reducing substance (II) ("diosterol") C<sub>27</sub>H<sub>42</sub>O<sub>2</sub>, having the typical grouping ·C:C(OH)·CO· of diosphenol and identical with the substance C<sub>27</sub>H<sub>42</sub>O<sub>2</sub> of Inhoffen (A., 1936, 1104) and Butenandt and Schramm (*ibid.*, 1512). (I); its immediate oxidation products may be steps in the biological formation from cholesterol (III) of the labile cortical hormone of the adrenals. (III) is converted into (I) by treatment of its dibromide with AgOAc in C<sub>5</sub>H<sub>5</sub>N at room temp. L. S. T.

**Constituents of the adrenal gland.** IX.—See A., II, 380.

**Relation of the pituitary to liver-glycogen production and utilisation.** O. COPE (J. Physiol., 1937, 88, 401—416).—The reduction of glycogen (I) production on hypophysectomy first noted by Houssay *et al.* is observed in young rabbits. Blood-sugar in the fasting state is maintained until liver-(I) from exogenous sources becomes depleted, when it falls rapidly to convulsive levels. Glucose (II) utilisation is unaffected and (II) given intravenously is readily converted into liver-(I). Adrenaline and insulin do not cause storage of (I) in the liver. Utilisation of lactate given intravenously is probably impaired. Muscle-(I) is unaffected when liver-(I) is depleted. R. N. C.

**Species variation in thyrotropic activity of the pituitary gland.** I. W. ROWLANDS (J. Physiol., 1936, 88, 298—304). R. N. C.

**Influence of pituitary thyrotropic hormone on the vitamin-C content of the adrenals and liver of guinea-pigs.** A. LOESER and V. M. TRIKOUJUS (Arch. exp. Path. Pharm., 1937, 185, 227—234).—The vitamin-C content of the adrenals of guinea-pigs decreases and simultaneously that of the liver increases under the action of the hormone. The effect is, however, small and disappears with prolonged action, the adrenal -C content becoming > normal. P. W. C.

**Ovulation induced out of season.** R. RUGH (Science, 1937, 85, 588—589).—The technique of inducing ovulation in frogs during the non-breeding season by injection of the anterior pituitary hormone is described. In *Rana pipiens* the average male anterior pituitary is 16% heavier than and 60% as potent as the average female gland in this respect. L. S. T.

**Renal circulation and secretion of the dog, with special reference to the effect of pituitary (posterior lobe) extract.** H. HANDOVSKY and A. SAMAAAN (J. Physiol., 1937, 89, 14—31). R. N. C.

**State in the blood and excretion by the kidney of the antidiuretic principle of posterior pituitary extracts.** H. HELLER (J. Physiol., 1937, 89, 81—95).—Pituitrin (I) is adsorbed by some colloidal constituent of rabbit's blood *in vitro*. (I) injected intravenously into rabbits is retained to a considerable extent, the proportion excreted diminishing as the amount injected is increased. The kidney is able to liberate the adsorbed (I). R. N. C.

**Effect of progesterone on lactation in the rat.** S. J. FOLLEY and S. K. KON (Nature, 1937, 139,

1107).—When given to the lactating rat, relatively high doses of progesterone neither inhibit established lactation nor increase milk secretion as judged by the rate of growth of sucklings. L. S. T.

Effects on ovariectomised rats of progesterone alone and in combination with the other sexual hormones. V. KORENCHESKY and K. HALL (Nature, 1937, 140, 154).—Injection of progesterone (I) alone produced only slight changes in the uterus and vagina, but in certain combinations with small amounts of oestrone (II) or oestradiol the histological structure showed typical progestational changes. The addition of various doses and combinations of testosterone or its propionate and  $\Delta^4$ -androstenedione to (I) and (II) improved general development in the uterus and vagina. L. S. T.

Action of progesterone on the uterus of the rabbit and its antagonism by oestrone. J. M. ROBSON (J. Physiol., 1936, 88, 100—111).

R. N. C.

Gravimetric determination of sodium pregnanediol glycuronate (an excretion product of progesterone). E. H. VENNING (J. Biol. Chem., 1937, 119, 473—480; cf. A., 1936, 1564).—Urine (containing 20—40 mg.) is extracted with BuOH and the extracts are evaporated to dryness. The residue is taken up in 0.1N-NaOH, and the solution again extracted with BuOH. The extract is washed with H<sub>2</sub>O and evaporated to dryness. 5 c.c. of H<sub>2</sub>O are added to the residue, which is then warmed to 50° and 95 c.c. of COMe<sub>2</sub> are added. The ppt. which settles overnight at 5—10° is collected, dissolved by warming with a few drops of H<sub>2</sub>O and sufficient EtOH, filtered, evaporated, and the residue weighed. The % recovery for different levels of the glycuronate is given. P. G. M.

Oestrogenic activity of *p*-hydroxypropenylbenzene (anol). E. C. DODDS and W. LAWSON (Nature, 1937, 139, 1068—1069).—The high activity previously reported (this vol., 229) appears to be due to a substance, possibly a polymeride of anol, from the mother-liquor occasionally separating with the anol. Large doses of all preps. of anol, however, are active. L. S. T.

Oestrogenic substances in the Dead Sea. B. ZONDEK (Nature, 1937, 140, 240).—A sandy mud from the Dead Sea possesses oestrogenic activity. The surface H<sub>2</sub>O is free from oestrogenic substances, but the deep sea H<sub>2</sub>O contains 100 mouse units per litre. Salt manufactured from the Dead Sea contains a similar amount. Male sex hormones and progesterone could not be detected. The mud contains a yellow dye of the lyochrome group. L. S. T.

Oestrous reactions, including mating, produced by triphenylethylene. J. M. ROBSON and A. SCHÖNBERG (Nature, 1937, 140, 196).—These effects have been produced in ovariectomised mice and in hypophysectomised rabbits. The oestrogenic activity of C<sub>2</sub>HPh<sub>3</sub> is approx. 10<sup>-4</sup> of that of oestrone, but effects are of marked duration. L. S. T.

Oestrogenic hormones in the ovaries of swordfish. A. I. WEISMAN, D. I. MISHKIND, I. S. KLEINER, and C. W. COATES (Endocrinol., 1937, 21, 413—

414).—Less than 6 rat units of oestrogenic hormone were extracted from 10 lb. of swordfish ovaries.

P. G. M.

Comparative action of injections of oestrin and a combination of oestrin and anterior pituitary-like substance on the anterior pituitary. J. M. WOLFE (Anat. Rec., 1937, 68, 237—248). R. N. C.

Biogenesis of primary sex hormones. I. Fate of oestrins injected into the rabbit. G. PINCUS and P. A. ZAHL (J. Gen. Physiol., 1937, 20, 879—893).—The extraction and determination of oestrone (I) and oestriol (II) from rabbit's urine is described. Injections of (I) and (II) into rabbits under varying conditions show that oestrone is converted into oestriol in the uterus and that progesterone facilitates the reaction. Some conversion of oestrone into oestradiol is indicated. E. M. W.

Effect of continued theelin injections on the body growth and organ weights of young female rats. C. B. FREUDENBERGER and F. W. CLAUSEN (Anat. Rec., 1937, 68, 133—144). R. N. C.

"Sodium-retaining effect" of the sex hormones. G. W. THORN and G. A. HARROP (Science, 1937, 86, 40—41).—Subcutaneous injection of oestradiol (I) results in a marked decrease in the renal Na<sup>+</sup> excretion and a reduced urine output in a normal male dog. Continued injections of oestrogenic material into normal male and female dogs does not prevent an ultimate return of Na<sup>+</sup> excretion to a normal level. Comparison of the Na-retaining effect of different sex hormones shows that (I) and progesterone are the most active substances in this respect. Pregnanediol also produces this retention. A single injection of (I) in Addison's disease resulted in retention of Na<sup>+</sup>, Cl<sup>-</sup>, and H<sub>2</sub>O. L. S. T.

Vaginal hydrogen-ion concentration in monkeys injected with oestrone. R. M. RANSON and S. ZUCKERMAN (J. Physiol., 1937, 89, 96—98).—The vaginal *p<sub>H</sub>* falls between 5.2 and 8.7. It is independent of the amount of oestrone given or the period of injections, but in individual animals it appears to remain const. under different conditions of injection. R. N. C.

Effect of female sex hormones on the oxygen consumption of normal rats, and on the tolerance to desiccated thyroid. D. N. DANFORTH, R. R. GREENE, and A. C. IVY (Endocrinol., 1937, 21, 361—367).—Large doses of oestrone, oestriol, emmenin, progesterone, and the gonadotropic factor of pregnancy urine exert little effect on the O<sub>2</sub> consumption of female rats, but decrease the effect of feeding desiccated thyroid. P. G. M.

Pregnane-3:17:20-triol from the urine of women showing the adreno-genital syndrome. G. C. BUTLER and G. F. MARRIAN (J. Biol. Chem., 1937, 119, 565—572).—The urine of two women showing the syndrome (but not that of one of them after removal of the enlarged adrenal, that of normal men, or that of normal pregnant or non-pregnant women) contained pregnane-3:17:20-triol, m.p. 243—244° (diacetate, m.p. 136.5°), oxidised by Pb(OAc)<sub>4</sub> to MeCHO and 3-epihydroxyaticholan-17-one. Pregnanediol was also present. W. McC.

**Functional relationship between the ovarian hormones of primates.** R. COURRIER and G. GROS (Compt. rend. Soc. Biol., 1937, 125, 746—748).—Folliculin is readily dominated by progesterin and has no anti-luteinising action on the endometrium.

H. G. R.

**Changes in relative amounts of follicle-stimulating and luteinising hormones in the pituitary of the female rat.** S. L. LEONARD (Endocrinol., 1937, 21, 330—334).—Castration of female rats increases the follicle-stimulating hormone (I) > the luteinising hormone (II). Subsequent oestrone (III) treatment reduces (II) to <, and (I) almost to, normal. (III) decreases the response of immature female rats to (I) but not to (II).

P. G. M.

**Comparative action of gonad-stimulating hormones on the rat ovary.** H. L. FEVOLD, F. L. HISAW, and R. O. GREEP (Endocrinol., 1937, 21, 343—345).—Continued administration of follicle-stimulating hormone (I) produces luteinisation of the ovaries of normal immature rats but not those of hypophysectomised rats. Tannic acid and  $\text{Cu}(\text{OAc})_2$  do not alter the quant. nature of the response to either (I) alone or (I) + luteinising hormone.

P. G. M.

**Test for ovarian follicular hormone and other oestrogens.** E. ALLEN, G. M. SMITH, and W. U. GARDNER (Endocrinol., 1937, 21, 412—413).—The material to be tested and 0.1 mg. of colchicine in aq. solution are injected in this order within a few hr. in spayed mice or rats and, 9½ hr. after the latter injection, a specimen of vaginal wall is taken for sectioning. Frequent mitoses in the basal layers indicate a positive result.

P. G. M.

**Determination of folliculin in ovarian powders.** A. CHOAY (Compt. rend. Soc. Biol., 1937, 125, 857—858).—The solids extracted by boiling  $\text{EtOH}$  are treated with  $\text{COMe}_2$  and the  $\text{COMe}_2$ -sol. substance is dissolved in oil and tested on ovariectomised rats. Samples examined contained approx. 20 international units per g.

H. G. R.

**Inhibition of the gonadotropic activity of pregnancy urine extract by the serum of rabbits injected with an extract of male urine.** P. DE FREMERY and B. SCHEYGROND (Nature, 1937, 139, 1015—1016).—Enlargement of the uterus, oestrus, and luteinisation, produced by injection of a prep. from urine of pregnancy into immature female rats, are completely inhibited by simultaneous injection of antigonadotropic serum obtained by repeated injection of a negligibly gonadotropic extract of human male urine into a rabbit.

L. S. T.

**Antagonistic action of testosterone and folliculin on the capon's comb.** P. GLEY and J. DELOR (Compt. rend. Soc. Biol., 1937, 125, 813—815).—This is observed if the dose of folliculin is 5 times that of testosterone.

H. G. R.

**Biological properties of some new derivatives of testosterone.** R. DEANESLY and A. S. PARKES (Biochem. J., 1937, 31, 1161—1164).—Testosterone-oxime and its propionate are only slightly active compared with testosterone (I) and its propionate on either capons or castrated rats. The diacetate of the

enolic form of (I) shows activity similar to that of (I) 17-monoacetate.

P. W. C.

**Specific vaso-dilating and plain-muscle stimulating substances from accessory genital glands in man and certain animals (prostaglandin and vesiglandin).** U. S. VON EULER (J. Physiol., 1936, 88, 213—234).—Prostaglandin (I), obtained from human prostate and seminal vesicles and sheep vesicular gland, is sol. in  $\text{H}_2\text{O}$ ,  $\text{EtOH}$ , and  $\text{COMe}_2$ , and in  $\text{Et}_2\text{O}$  and  $\text{CHCl}_3$  at an acid  $p_H$ . It is stable at  $p_H$  1—7, but is destroyed by more conc. acid, alkali at all concns., and free halogens. It migrates to the anode in cataphoresis experiments. Vesiglandin, obtained from monkey prostate and vesicular glands, resembles (I) in solubility, but is less stable in acids and alkalis.

R. N. C.

**Reticulo-endothelial system and the concept of the "anti-hormone."** A. S. GORDON, W. KLEINBERG, and H. A. CHARIPPER (Science, 1937, 86, 62—63).—A comparison of the response of immature splenectomised and normal female rats to daily injections of pregnancy urine extract shows a connexion between reticulo-endothelial activity and the development of refractoriness to heterozoic endocrine extracts; the antagonistic substances produced in response to chronic treatment with such extracts are thus probably antibody-like.

L. S. T.

**Early work on insulin.** F. G. BANTING (Science, 1937, 85, 594—596).—An address.

L. S. T.

**Crystalline insulin. X. Time course of insulin inactivation by normal blood.** H. KOHL, H. SELBACH, and A. JANNING (Arch. exp. Path. Pharm., 1937, 185, 212—220).—Inactivation of insulin by the blood of normal adults is complete after about 22 hr. (normal physiological variation 13—30 hr.) and varies with age: < 20 years, 28 contact hr.; 20—60 years, 21—22 hr.; > 60 years, 18 hr.

P. W. C.

**Two crystalline modifications of insulin.** D. CROWFOOT (Nature, 1937, 140, 149—150).—X-Ray examination shows that the crystal structures of the prismatic, birefringent crystals is the same as that of the rhombohedral crystals; thus the two forms are not polymorphic. The X-ray pattern of the prismatic form differs only by showing a more marked diffuse ring with a spacing of approx. 4.5 Å., a val. possibly characteristic of the presence of amorphous matter, which may be responsible for the change in crystal form.

L. S. T.

**Structure of insulin.** D. M. WRINCH (Science, 1937, 85, 566—567).—The structure of insulin (I) is described in terms of the cyclol theory of protein structure. The view that crystal (I) contains certain metals as combined constituents and not as impurities, and the fact that the optimum acidity for the crystallisation of (I) in presence of certain metals is  $p_H$  6.0—6.2, are explained.

L. S. T.

**Ultrafiltration of insulin of varying purity through membranes of graduated porosity.** F. SCHMID and A. RIEGERT (Compt. rend. Soc. Biol., 1937, 125, 881—884).—No separation of the active principle from impurities was effected.

H. G. R.

**Course of carbohydrate metabolism in various vascular regions after injection of glucose, insulin, and adrenaline.** F. MEYTHALER and A. BRUNING (*Arch. exp. Path. Pharm.*, 1937, 185, 203—211).—A series of curves shows the effect in dogs on the sugar content of blood from the vena portæ, cava hepatica, and the femoral artery of intravenous injection of glucose (I), insulin (II), and adrenaline (III). After (I), the blood-sugar vals. increased in all cases, the increase being least in the hepatic vein, indicating retention of sugar in the liver. After (II), the liver to a slight extent mobilises sugar whereas all other organs increase their retention of sugar. After (III), increased mobilisation of glycogen occurs in the liver. P. W. C.

**Experimental parathyroid insufficiency. I. Mineral constituents of dog's serum in acute and latent tetany. II. Adsorbable fraction of serum-calcium in acute and chronic parathyroid insufficiency. III. Effect of insulin on the blood-calcium of the normal dog and in latent tetany.** F. MATHIEU (*Arch. internat. Physiol.*, 1937, 44, 516—528, 529—534, 535—541).—I. In latent tetany (7—10 months after thyroparathyroidectomy) blood-Ca can be as low and inorg. P as high as in the acute form. Serum-Mg is decreased in the acute but normal in the latent form. No variation in Na or K is observed in either case.

II. In both acute and latent tetany blood-Ca absorbable on BaSO<sub>4</sub> is increased.

III. Blood-PO<sub>4</sub>''' and -Ca absorbable on BaSO<sub>4</sub> are decreased in tetany after injection of insulin but little increase in blood-Ca was observed.

H. G. R.

**Fatty acids, lipin-phosphorus, and cholesterol in duck's blood after thyroidectomy and injection of pituitary anterior lobe extract.** J. BENOIT and S. B. BOGDANOVITCH (*Compt. rend. Soc. Biol.*, 1937, 125, 891—894).—A considerable increase in the levels of fatty acids, lipin-P, and cholesterol occurs after thyroidectomy.

H. G. R.

**Metabolism of a dwarf under treatment with growth hormone.** H. C. STRUCK and S. A. SZUREK (*Endocrinol.*, 1937, 21, 387—393).—Administration of growth hormone and vitamin-D to a dwarf produced no noticeable change in condition except increase in wt. N was retained but Ca and P balances were unchanged.

P. G. M.

**Thymocrescin and vitamins.** L. ASHER (*Z. Vitaminforsch.*, 1937, 6, 265—266).—The hormonal character of thymocrescin (cf. Bachmann, A., 1934, 565) is discussed.

F. O. H.

**Vitamin content of marine oils.**—See B., 1937, 807.

**Photo-electric method for measuring vitamin-A.** R. L. MCFARLAN, J. W. REDDIE, and E. C. MERRILL (*Ind. Eng. Chem. [Anal.]*, 1937, 9, 324—326).—A photo-electric apparatus for the determination of the light absorption of fresh liver oils in the 3280 Å region is described.

F. N. W.

**Comparison of spectrophotometric and biological assays for vitamin-A.** C. L. BARTHEN and C. S. LEONARD (*J. Amer. Pharm. Assoc.*, 1937,

26, 515—524).—Data are given for a large no. of cod-liver oils. The adoption of the spectrophotometric method is recommended for U.S.P. assays.

F. O. H.

**Aqueous colloidal solutions of vitamin-A.** A. RATSCHESKI (*Z. Vitaminforsch.*, 1937, 6, 203—206).—The purified -A prep. is dissolved in absence of O<sub>2</sub> in a min. of EtOH, cooled to -15°, separated from sterols, and the resulting solution mixed with a little H<sub>2</sub>O and evaporated free from EtOH. This yields a colloidal aq. solution containing up to 6250 international units per c.c.

F. O. H.

**Contents of carotene and vitamin-A in leprosy sera.** I. IKEGAKI (*Z. Vitaminforsch.*, 1937, 6, 206—209).—The carotene content is reduced in lepra nervorum, maculosa, and tuberosa, but the -A content is reduced only in the first two.

F. O. H.

**Spectrophotometric method of assaying vitamin-A and carotene; vitamin-A activity of Indian foodstuffs.** N. K. DE (*Indian J. Med. Res.*, 1937, 24, 737—749).—Vitamin-A can only be extracted quantitatively by EtOH from a light petroleum solution containing carotene (I), if the mixture is first saponified and extracted 7—10 times; foreign materials affect the partition coeff. of -A between the two solvents. Adsorption on C removes many impurities without causing loss of -A. Both -A and (I) are highly unstable to light in CHCl<sub>3</sub>, which is not recommended for use in spectrophotometric work. Evidence in support of the validity of the technique and the -A and (I) contents of 70 foodstuffs are given.

R. N. C.

**Assimilation of vitamin-A and carotene by rats from some common foods: conversion factor, I.U./E., proposed by the International Vitamin Conference.** N. K. DE (*Indian J. Med. Res.*, 1937, 24, 751—766).—Absorption of vitamin-A from the intestine after ingestion of a no. of foods is almost complete, but only 45—65% of the carotene (I) is retained. (I) absorption is not significantly affected by differences in body-wt., or in dietary fat, salts, or -B. (I) appears to be utilised best when fed in an oil solution. The val. 1600 is probably appropriate for the conversion factor I.U./E.

R. N. C.

**Carotene content of some common Bengali foodstuffs.** B. AHMAD, D. N. MULLICK, and B. N. MAZUMDAR (*Indian J. Med. Res.*, 1937, 24, 801—806).—Carotene is present in large quantities only in vegetables, particularly those of the leafy type.

R. N. C.

**Absorption of carotene and vitamin-A in man.** H. E. C. WILSON, S. M. DAS GUPTA, and B. AHMAD (*Indian J. Med. Res.*, 1937, 24, 807—811).—Absorption of carotene does not appear to be affected by cooking the food. Absorption on a fat diet is > without fat; β-carotene may be absorbed preferentially. A highly conc. extract of vitamin-A is absorbed completely.

R. N. C.

**β-Carotenal.**—See A., II, 378.

**Dynamics of carbohydrate metabolism in dogs and pigeons suffering from avitaminosis-B.**

M. S. LEVINSON (Z. Vitaminforsch., 1937, 6, 209—227).—The nervous disturbances due to avitaminosis-*B* are preceded by disturbances in carbohydrate metabolism. In pigeons, increased levels of blood-sugar and -lactic acid occur. Blood-ketones increase and liver-glycogen diminishes. F. O. H.

**Antiberiberi action of phenanthrene derivatives.** J. SANCHEZ-RODRIGUEZ and J. M. SARDA (Z. Vitaminforsch., 1937, 6, 193—203).—The appearance of polyneuritic symptoms in pigeons on a vitamin-*B*-free diet is delayed by injection of substances of the cyclopentenophenanthrene type (e.g., male and female sex hormones, vitamin-*D*). F. O. H.

**Vitamin-*B*<sub>1</sub> and fatty livers.** E. W. MCHENRY (J. Physiol., 1937, 89, 287—295).—Oral administration of vitamin-*B*<sub>1</sub> to rats on a low-choline diet causes an increase in liver-fat (I). Without -*B*<sub>1</sub>, (I) is increased until the stores of -*B*<sub>1</sub> are exhausted, when it falls; it is increased again by -*B*<sub>1</sub>. The increase of (I) on administration of -*B*<sub>1</sub> is still exhibited when dietary fat is increased, or when the diet is fat-free and high in carbohydrate. R. N. V.

**Vitamin-*B*<sub>1</sub> content of some common Indian foodstuffs.** H. E. C. WILSON, B. AHMAD, G. RAY, and R. C. GUHA (Indian J. Med. Res., 1937, 24, 813—816).—Vitamin-*B*<sub>1</sub> is high in cereals but relatively low in vegetables. R. N. C.

**Determination of aneurine (= vitamin-*B*<sub>1</sub>) in urine by the thiochrome method.** J. GOUDSMIT and H. G. K. WESTENBRINK (Nature, 1937, 139, 1108—1109).—Jansen's method for aneurine (this vol., 77) has been applied to human urine (data tabulated). The results agree with those obtained by Harris and Leong (A., 1936, 904) using the bradycardia method. L. S. T.

**Stability of ascorbic and dehydroascorbic acids.** V. A. ENGELHARDT and V. N. BUKIN (Biochimia, 1937, 2, 587—601).—Irreversible transformation of ascorbic acid (I) is not catalysed by substances (Cu, ascorbase) catalysing conversion of (I) into dehydroascorbic acid (II); the reaction is not one of oxidation, since it takes place with equal velocity in presence or absence of O<sub>2</sub>. (I) is relatively thermostable, but (II) is irreversibly inactivated at 60° (10 min. at *p*<sub>H</sub> 7), and instantaneously at 100°. (II) is also rapidly inactivated at high *p*<sub>H</sub> at room temp. (90% destruction at *p*<sub>H</sub> 9 in 10—20 min.). Analogous results are obtained for solutions of plant-cell constituents containing (I) and (II). R. T.

**Coupled oxidation of ascorbic acid and hæmochromogens.** R. LEMBERG, B. CORTIS-JONES, and M. NORRIE (Nature, 1937, 139, 1016—1017).—The catalysis of the oxidation of ascorbic acid (I) at a *p*<sub>H</sub> < 7 by hæmochromogens is confirmed (cf. A., 1936, 390). Under these conditions, hæmochromogens also undergo oxidation to verdohæmochromogen. The coupled oxidation of (I) and C<sub>5</sub>H<sub>5</sub>N hæmochromogen has been studied and its mechanism is discussed. L. S. T.

**Effect of anions on the oxidation of vitamin-*C*.** N. BEZSSONOFF and M. WOLOSZYN (Compt. rend. Soc. Biol., 1937, 125, 884—886).—The rate of oxida-

tion varies with the anion present in the order PO<sub>4</sub><sup>'''</sup> > NO<sub>3</sub><sup>'</sup> > OAc<sup>'</sup> > Cl<sup>'</sup>. H. G. R.

**Mannose as a possible precursor of ascorbic acid in the tissues of the rat.** J. R. HAWTHORNE and D. C. HARRISON (Biochem. J., 1937, 31, 1061—1064).—The synthesis by Guha and Ghosh (A., 1935, 131, 416, 903) of ascorbic acid (I) from mannose (II) when minced rat liver is incubated in Ringer-PO<sub>4</sub><sup>'''</sup> solution in presence of O<sub>2</sub> could not be confirmed. Intravenous or subcutaneous injection of (II) into rats produced no increase in the (I) content of the liver. P. W. C.

**Histological study of renal elimination of ascorbic acid.** A. GIROUD and C. P. LEBLOND (Anat. Rec., 1937, 68, 113—126).—Ascorbic acid (I) is detected histologically in animal organs by injection of acid AgNO<sub>3</sub> into the aorta immediately after bleeding. (I) is present in the kidneys of a no. of animals. It disappears progressively from the kidneys of guinea-pigs deprived of vitamin-*C* in their food, but remains in the kidneys of rats. A single intravenous injection of 50 mg. of (I) into the guinea-pig raises kidney- and urinary (I) to very high vals. (I) is found only in the cells of the proximal convoluted tubule and the descending branch of Henle's loop. R. N. C.

**Thyroid and adrenal glands during experimental scurvy and vitamin-*C* treatment.** M. M. MAY (Z. Vitaminforsch., 1937, 6, 239—250).—In guinea-pigs, scurvy is accompanied by increased activity and characteristic histological changes in the thyroid and by a widening of the adrenal cortex. These symptoms disappear on treatment with vitamin-*C*, which also increases the lipin content of the adrenal cortex. F. O. H.

**Vitamin-*C* content of *Hibiscus sabdariffa*, L.** G. LORENZINI (Arch. Ist. Biochim. Ital., 1937, 9, 123—130).—Titration with 1 or 2 : 6-dichlorophenol-indophenol indicates a content of 0.385—0.580% in the dried plant, but tests on scorbutic guinea-pigs indicate complete absence of vitamin-*C*. F. O. H.

**Determination of ascorbic acid in tissues.** P. MEUNIER (Bull. Soc. Chim. biol., 1937, 19, 877—892).—The method depends on the study of the kinetics of the decolorisation of the indophenol reagent by the material and is applied to fruit juice, urine, plasma, and animal organs. The effect of interfering substances is eliminated by extrapolation of the curve of the rate of decolorisation back to zero time. A. L.

**Chemical activation of sterols. III. Activation of cholesterol. IV. Activation of cholesterol and cholesterolene by various reagents.** J. C. ECK and B. H. THOMAS (J. Biol. Chem., 1937, 119, 621—630, 631—640; cf. this vol., 156).—III. Cholesterol (I) acquires antirachitic properties on heating with H<sub>2</sub>SO<sub>4</sub>, H<sub>2</sub>SO<sub>4</sub>-SO<sub>3</sub>, SO<sub>3</sub>H-CH<sub>2</sub>-CO<sub>2</sub>H, or ClSO<sub>3</sub>H in AcOH. SO<sub>2</sub> is evolved. With H<sub>2</sub>SO<sub>4</sub> max. potency is obtained with (I) 0.001, H<sub>2</sub>SO<sub>4</sub> 0.002, and Ac<sub>2</sub>O 0.0025 g.-mol. in 4 c.c. of AcOH at 85—90° for 3 hr. The treatment does not produce a provitamin-*D* which can be activated by ultra-violet irradiation.

IV. (I) is activated by heating with  $\text{KHSO}_4$ ,  $\text{CuSO}_4$ ,  $\text{ZnCl}_2$ ,  $\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$ ,  $\text{P}_2\text{O}_5$ ,  $\text{CCl}_3 \cdot \text{CO}_2\text{H}$ ,  $\text{AlCl}_3$  in  $\text{C}_6\text{H}_6$ , or  $\text{H}_3\text{PO}_4$  in  $\text{Ac}_2\text{O}$ , cholesterol by heating with  $\text{KHSO}_4$ ,  $\text{NH}_4\text{HSO}_4$ ,  $\text{P}_2\text{O}_5$ , or  $\text{HCl} \cdot \text{Et}_2\text{O}$ .

F. O. H.

**Mode of action of vitamin-D. V. Absorption of phosphates from isolated loops of the small intestine in the rat.** R. NICOLAYSEN (Biochem. J., 1937, 31, 1086—1088; cf. this vol., 104, 156).— $\text{KH}_2\text{PO}_4$  and Na glycerophosphate are absorbed equally well in normal and vitamin-D-deficient rats. The rate of absorption  $\propto [\text{PO}_4^{'''}]$  in the lumen and is uninfluenced by  $\text{CH}_3\text{I} \cdot \text{CO}_2$  poisoning. Absorption of inorg.  $\text{PO}_4^{'''}$  is independent of esterification with glucose. Esterified  $\text{PO}_4^{'''}$  is absorbed largely without hydrolysis. Hydrolysis in the intestinal lumen occurs only at  $p_{\text{H}} > \text{normal}$ .

E. A. H. R.

**Irradiation of compounds of the ergosterol type.**—See A., II, 376.

**Crystals with vitamin-K potency.** H. J. ALMQUIST (Nature, 1937, 140, 25—26).—Vitamin-K has been obtained in a cryst. fraction isolated by cooling mol. distillation concentrates in MeOH with solid  $\text{CO}_2$ . The cryst. fraction is approx. 8 times as potent as the vitamin-containing mother-liquor.

L. S. T.

**Vitamin-P test.** A. BENTSATH and N. B. DAS (Z. physiol. Chem., 1937, 247, 258—261; cf. this vol., 234).—Vitamin-P prolongs the life of guinea-pigs on a scorbutic diet only when they have previously received diet completely adequate in all essentials or when deficiencies, not necessarily reflected in diminished growth, have been made good. Some winter diets may cause such deficiencies.

W. McC.

**Growth of *Lemna minor*.** E. J. WINTER (Nature, 1937, 139, 1070—1071).—Growth in a colony is exponential, but the rate of production of daughter fronds from a parent is a hyperbolic function of time.

L. S. T.

**Short periodic growth cycle and a secular variation in *Lemna minor*.** H. DICKSON (Nature, 1937, 140, 112).—Certain deviations from the ordinary compound interest law of frond increase for *L. minor* grown under const. conditions in which light, temp., and culture solution were controlled have been established.

L. S. T.

**Action of heat, light, and radiations on plants.**—See B., 1937, 821.

**Wave-lengths of radiation in the visible spectrum promoting germination of light-sensitive lettuce seed.** L. H. FLINT and E. D. MCALISTER (Smithsonian Misc. Coll., 1937, 96, No. 2, 8 pp.).—Light of  $\lambda$  5200—7000 Å. promotes germination of sensitive lettuce seed, longer  $\lambda$  being the more effective (crit.  $\lambda$  6700 Å.). The most active radiation is that most abundantly absorbed by chlorophyll (I) in the same region. (I) probably occurs in the seed.

**Influence of light on the inflow of nutrient substances in plants.** T. T. DEMIDENKO and V. P. GOLLE (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 375—380).—Transference of "long-day"

plants to "short-day" conditions induces much vegetative growth. Increasing the period of illumination of short-day plants increases the period of vegetative growth and the crop yield. Elimination of nutrients by short-day plants increases with the "day" period. Intake of minerals is probably related to the extent of photosynthesis. A. G. P.

**Movement of assimilate in tomato seedlings.** B. D. BOLAS and D. W. GOODALL (Ann. Rept. Exp. Res. Sta. Cheshunt [1936], 1937, 82—87).—Respiration of young tomato leaves is very high. Translocation of assimilate from older leaves of high photosynthetic activity to young rapidly growing leaves takes place throughout the day and night, the flow probably reaching a max. during afternoon and evening. Only a small proportion of the daily increase in dry matter of very young leaves is due to direct photosynthesis.

A. G. P.

**Seasonal and diurnal changes in water content of tomato seedlings.** (Ann. Rept. Exp. Res. Sta. Cheshunt [1936], 1937, 92—96).—Annual variation in  $\text{H}_2\text{O}$  content (max. in spring and min. in autumn) affects all leaves similarly. Diurnal changes are small except in young leaves in summer (min. in evening and max. in early morning). Infection with mildew probably occurs most readily when leaves are fully turgid.

A. G. P.

**Upward transport of minerals through the phloem of stems.** F. G. GUSTAFSON and M. DARKE (Science, 1937, 85, 482—483).—Experiments with *Sedum praealtum* and *Bryophyllum calycinum*, using activated red P as indicator, show that the activated P is transported as  $\text{PO}_4^{'''}$  up the stem of a plant through the phloem.

L. S. T.

**Wettability of the cellulose walls of the mesophyll in the leaf.** D. H. BANGHAM and F. J. LEWIS (Nature, 1937, 139, 1107—1108).—Surfaces of the mesophyll of *Ficus elastica* have only a small adhesion to  $\text{H}_2\text{O}$ , but the outer tissues of the fine lateral veins have a much greater adhesion energy. Org. liquids such as  $\text{C}_6\text{H}_6$ ,  $\text{CHCl}_3$ ,  $\text{Et}_2\text{O}$ , and essential oils, but not  $\text{H}_2\text{O}$ , infiltrate rapidly into the mesophyll air-space system by capillarity. Transpiration does not occur from a liquid film of  $\text{H}_2\text{O}$  on the cell walls of the mesophyll.

L. S. T.

**Chlorosis of rice induced by iron deficiency.** E. C. TULLIS and E. M. CRALLEY (Phytopath., 1936, 26, 111).—The general effects of Fe chlorosis are examined. Varietal differences in susceptibility were considerable.

A. G. P.

**Pigmentation in the root of the cotton plant.** H. V. JORDAN, D. R. EGGLE, J. H. HUNTER, and J. E. ADAMS (Science, 1937, 86, 60—61).—Field experiments indicate a general correlation of this pigmentation with the physiological age of the plant, the reaction of the soil, the effect of fertilisers, and the incidence of cotton root rot.

L. S. T.

**Root system of sugar-cane. IV. Absorption and exudation of water and mineral substances.** H. EVANS (Empire J. Exp. Agric., 1937, 5, 112—124; cf. A., 1936, 121).—The rate of development of the root system of young canes (but not in more

mature stools) is probably the limiting factor in mineral intake. In very dry conditions normal absorption practically ceases, except in the case of K which accumulates rapidly under these conditions. Analyses of exudates from cut roots are notable for their high  $\text{SiO}_2$  content. Exudates from surface, buttress, and deep roots showed characteristic differences in composition, especially in org. matter contents. There is no evidence of a marked distinction between feeding and anchoring roots. All actively absorb nutrient material. A. G. P.

**Composition of avocado fruits.** A. R. C. HAAS (J. Agric. Res., 1937, 54, 669—687).—The acidity of the fruit pulp increases towards the skin, possibly because of the more easy removal of  $\text{CO}_2$  from the better aerated tissue. By comparison with the tip halves the stem halves of fruit usually contain more sugar, Ca, S, and Cl and less dry matter, ash, K, Mn, total N, and  $\text{NO}_3^-$ . Varietal differences in this respect are recorded. With advancing maturity the sugar content of the pulp diminishes and there is a decrease in % of Na in the ash and an increase in the % of inorg. P and Mn in the pulp. A notably high proportion of Cu occurs in the pulp and skin of the Anaheim variety. A. G. P.

**Fruit-bud studies. III. Sultana: relations between shoot growth, chemical composition, fruit-bud formation, and yield.** J. E. THOMAS and C. BARNARD (J. Council Sci. Ind. Res. Australia, 1937, 10, 143—157).—Fruit-bud formation is closely associated with starch accumulation in annual wood but not with the N content. Accumulation of starch is related to the time of max. growth rather than to the rate of growth, whereas accumulation of N depends on the max. growth rate > on the time of growth. Fertility of canes is directly correlated with the time of max. growth, i.e., with the time of inflexion of the growth curve. The current year's crop restricts shoot growth and starch accumulation. A. G. P.

**Comparative efficiency of free and combined nitrogen for nutrition of the soya bean.** W. W. UMBREIT, F. S. ORCUTT, and P. W. WILSON (J. Bact., 1936, 31, 92—93).—Plants grown under conditions favouring excessive carbohydrate synthesis (intense sunlight, adequate  $\text{CO}_2$  supply, drought) require artificial supplies of combined N for normal growth, or must be shaded to restrict formation of carbohydrate. Under conditions permitting optimum carbohydrate synthesis assimilation of free  $\text{N}_2$  and subsequent growth are more rapid than in uninoculated forms supplied with  $\text{NH}_4\text{NO}_3$ . With sub-optimal synthesis of carbohydrate differences in efficiency of fixed and free N diminish. In carbohydrate-deficient plants inoculation was inferior to a supply of fixed N. A. G. P.

**Diffusion of nitrogenous compounds from healthy legume nodules or roots.** C. A. LUDWIG and F. E. ALLISON (J. Bact., 1936, 31, 93—94).—Mixed sand-cultures of inoculated legumes and non-legumes failed to show stimulated growth of the legume or the appearance in the medium of N compounds excreted from nodules. A. G. P.

**Metabolism of organic acids of tobacco leaf during culture.** G. W. PUCHER, A. J. WAKEMAN, and H. B. VICKERY (J. Biol. Chem., 1937, 119, 523—534; cf. A., 1934, 710; this vol., 328).—In excised leaves exposed to light in  $\text{H}_2\text{O}$ , dil. aq. glucose, or nutrient salt solution [ $(\text{NH}_4)_2\text{SO}_4$  as N source] the total acidity and the contents of  $\text{H}_2\text{C}_2\text{O}_4$ , malic (I) and citric acid (II) change only slightly. In the dark the (I) content diminishes greatly and the (II) content increases, the additional (II) probably being derived from (I); the  $\text{H}_2\text{C}_2\text{O}_4$  and total acidity remain unchanged. W. McC.

**Physiology of the metabolism of algæ. II. Substitutes for oxygen respiration of fresh and sea-water algæ. III. Distribution of flavins in marine algæ.** A. WATANABE (Acta Phytocchim., 1937, 9, 235—254; 255—264).—II. Respiration of *Chlorella ellipsoidea* is increased by addition of aldehydes, polyhydric alcohols, carbohydrates,  $\text{NH}_2$ -acids, and certain carboxylic acids particularly those of the aliphatic series. In general, aldehydes, mono- and poly-hydric alcohols, and carbohydrates do not appreciably increase the respiration of the green, brown, and red sea algæ, the case of mannitol and the brown algæ being exceptional. Respiration of Chlorophyceæ and Phæophyceæ is distinctly increased by addition of  $\text{NH}_2$ -acids and fatty acids, whereby the mol. size of the latter substances appears determinative. With *Chlorella*, green and brown sea algæ max. action occurs with acids containing 8—10 C. *iso*-Acids are invariably less effective than the corresponding *n*-acids. Certain unsaturated fatty acids, OH- and CO-monocarboxylic acids distinctly increase the respiration of green and brown sea algæ whereas di- and tri-carboxylic acids have very little effect. Respiration of Rhodophyceæ is increased to some extent by  $\text{NH}_2$ -acids, most distinctly in the case of *Gracilaria confervoides*.

III. Flavins are widely distributed among red, brown, and green marine algæ, the average content of 57 species being  $0.18 \times 10^{-6}$  g. per g. (dry wt.). The highest content ( $1.10$  or  $1.07 \times 10^{-6}$ ) is shown by *Iridoea pulchra* and *I. laminaroides*, respectively, whilst  $0.65 \times 10^{-6}$  is present in *Heterochordaria abietina*. The flavin (I) content of brown and green is usually < that of red species. In red and brown types 57—96% of the total (I) is present as flavo-protein. The (I) is well maintained in the dried technical products. H. W.

**Gaseous metabolism of pollen.** I. K. OKUNUKI (Acta Phytocchim., 1937, 9, 267—285).—Gaseous metabolism does not occur or is limited in pollen grains enclosed in the anther but sets in vigorously under germinable conditions. Pollen remains viable in a desiccator for about six months but dies in room air after two months. In preserved pollen germinative capacity is lost before the power to respire or ferment. Fresh pollen cannot germinate in anaerobiosis but can ferment glucose, giving equiv. amounts of EtOH and  $\text{CO}_2$ . Gaseous metabolism of pollen is more rapid in agar than in liquid media. On agar in the absence of glucose (I) the gas reaction of *Camellia* pollen diminishes continuously with time whereas in presence of (I) it increases during 3—4 hr.

and then declines. With the pollen of *Lilium* species rapid diminution is observed even in presence of (I). Utilisation of sugars is in the order (I) > fructose > sucrose > galactose > maltose > lactose > xylose > arabinose. Respiration of pollen is restricted by mannose. Various salt ions restrict the respiration and more strongly inhibit the germination of pollen or growth of the pollen tubes. With different types of pollen there is a distinct parallelism between restriction of  $O_2$  intake and growth of the tubes. With the pollen of *Lilium auratum* Ca<sup>++</sup> encourages growth and respiration. H. W.

**Phototropic response and carbon dioxide assimilation of plants in polarised light.** E. S. JOHNSTON (Smithsonian Misc. Coll., 1937, 96, No. 3, 7 pp.).—No evidence was obtained that polarised differed from non-polarised light in the phototropism or photosynthesis of *Avena* seedlings. A. G. P.

**Influence of light and carbon dioxide on photosynthesis.** E. L. SMITH (J. Gen. Physiol., 1937, 20, 807—830).—An optical system producing a high intensity is described. Measurements of the rate of photosynthesis are discussed mathematically (cf. A., 1936, 1433). A complex reaction mechanism involving > one photochemical action is suggested. E. M. W.

**Active principles in plant growth.** F. KÖGL (Naturwiss., 1937, 25, 465—470).—A lecture summarising recent advances in knowledge of plant hormones, bios, biotin, auxin A,  $\beta$ -indolylacetic acid, etc. P. W. C.

**Environmental conditions influencing the development of tomato pockets or puffs.** A. C. FOSTER and E. C. TATMAN (Science, 1937, 86, 21—22).—A summary of the chief results obtained in a study of the effects of soil- $H_2O$ , relative proportion of mineral nutrients, temp., and length of day period on the development of tomato pockets. L. S. T.

**Galls produced by plant hormones, including a hormone extracted from *Bacterium tumefaciens*.** N. A. BROWN and F. E. GARDNER (Phytopath., 1936, 26, 708—713).—Gall formation in a no. of plant species by indolyl-acetic and -propionic acids necessitated preliminary wounding. In many cases a lanoline prep. of growth-substance extracted from *B. tumefaciens* by  $Et_2O$  was more active than the above acids in producing galls. A. G. P.

**Effect of various hormones on the growth of plantules and development of their roots.** R. CASTAN and P. CHOUARD (Compt. rend. Soc. Biol., 1937, 125, 751—754).—Growth of the principal root of *Cucumis melo* is slightly, and that of the secondary roots considerably, decreased by insulin. Hetero-auxin greatly inhibits growth of the principal root. H. G. R.

**Distribution of substances acting as vegetable auxins in the organs of the guinea-pig.** H. BERRIER (Compt. rend. Soc. Biol., 1937, 125, 743—745).—The organs of excretion are the richest sources. H. G. R.

**Colchicine, "phytocarcinomata," and plant hormones.** L. HAVAS (Nature, 1937, 140, 191—192; cf. this vol., 239).—Colchicine inhibits the

growth of tumours produced in tomato plants by inoculation with *B. tumefaciens*. Comparison with the inhibition produced by removal of the flowers, exclusion of light from the terminal buds, and administration of palmitic acid indicates that (I) acts through intervention of the plant hormones. L. S. T.

**Xylenol method for determining nitrate-nitrogen and its use in studying the physiology of the sugar-beet.**—See A., I, 475.

**Micro-determination of nitrate in plant material, especially *Beta vulgaris*, by the xylenol method.** F. WERR (Z. wirts. Zuckerind., 1937, 87, 355—374).—The technique previously described (A., I, 475) is further modified to deal with 2—50  $\times 10^{-6}$  g. of  $NO_3-N$  per sample with an accuracy of  $\pm 5\%$ . Data for expressed sap of beet leaves are given. A. G. P.

**Determination of phosphate in plant extracts.** E. MICHEL-DURAND (Bull. Soc. Chim. biol., 1937, 19, 931—937).—The  $CCl_3 \cdot CO_2H$  extract of the material is treated with sodium molybdate, the  $PO_4'''$  complex shaken out with  $Et_2O$ , and the  $PO_4'''$  pptd. from the aq. extract after removal of the  $Et_2O$  with  $MgO$  mixture. A. L.

**Ash, calcium, and phosphorus content of some common Bengali foodstuffs.** H. E. C. WILSON, B. AHMAD, and D. N. MULLICK (Indian J. Med. Res., 1937, 24, 797—800).—Ca is highest in milk and milk products, and low in vegetables, except cabbage, bhindi, and spinach. Ca and P in atta and the dals are > in rice. R. N. C.

**Analysis of carbohydrates of the cell wall of plants. III. Determination of methylpentoses: factors influencing the decomposition of methylfurfuraldehyde during distillation.** C. R. MARSHALL and F. W. NORRIS (Biochem. J., 1937, 31, 1053—1060).—When methylfurfuraldehyde (I) is distilled in  $HCl$  solution using the Tollens procedure, about 27% is destroyed, partly by oxidation (the yield is greater in  $N_2$ ) but chiefly by the action of  $HCl$  which becomes more marked as its concn. increases. It is more satisfactory to distil in the presence of salt, which stabilises the acid concn. The yield of (I) from methylpentoses is not only affected by oxidation and  $[HCl]$  but varies with the configuration of the sugar. Rhamnose appears to decompose more readily than do pentoses. P. W. C.

**Fatty acids associated with banana starch.** L. LEHRMAN and E. A. KABAT (J. Amer. Chem. Soc., 1937, 59, 1050—1051).—Hydrolysis of purified banana starch reveals the presence of 0.2% of combined fatty acids, including palmitic, oleic, linoleic, and linolenic acid, and phytosterol, but no glycerol. R. S. C.

**Wax-like constituents of the cuticle of the cherry, *Prunus avium*.** L. K. S. MARKLEY and C. E. SANDO (J. Biol. Chem., 1937, 119, 641—645).—The light petroleum extractives (0.8% of the dried skin) include linoleic, oleic, palmitic, stearic, and acids >  $C_{18}$ , glycerol, and hydrocarbons (mainly nonacosane). The  $Et_2O$  extractives include  $d$ -glucosidylsitosterol and ursolic acid. F. O. H.

**Seeds of *Cichorium intybus*, L. Constituents of the oil from the seeds.** R. N. MISRA and S. DUTT (J. Indian Chem. Soc., 1937, 14, 141—143).—Extraction of the crushed seeds with  $C_6H_6$  gives an oil having  $d_4^{25}$  0.9229,  $n_D^{25}$  1.3795, f.p.  $-11^\circ$ , acid val. 11.2, sap. val. 193.1, Ac val. 14.8, I val. 95.6, Hehner val. 93.9, unsaponifiable matter 1.7%. Saponification gives fatty acids, m.p. 35—38°,  $d_4^{20}$  0.8931, neutralisation val. 192.5, mean mol. wt. 291.4, I val. 104.8. By the Twitchell method the fatty acids consist of 21.7% of saturated (mainly stearic and palmitic) and 78.3% of unsaturated (mainly oleic and linoleic) acids. The unsaponifiable portion gives a phytosterol, m.p. 131—133°. D. J. B.

**Sugar cane wax. I. Phytosterols.** T. MITUI (J. Agric. Chem. Soc. Japan, 1937, 13, 494—501).— $C_6H_6$  extraction of press-cake gave 8% of wax which contained 0.14% of stigmasterol and 0.77% of sitosterol. J. N. A.

**Components of *Psoralea corylifolia*, Linn.** T. R. SESHADRI and C. VENKATARAM (Proc. Indian Acad. Sci., 1937, 5, A, 351—356).—From the pericarp, by extraction of the entire seeds with  $Et_2O$ , were obtained an alkali-sol. resin, volatile essential oil, and non-volatile terpenoid oil, and from the crushed kernel, by extraction with light petroleum, a mixture of psoralen and isopsoralen and a fixed oil from which a sterol (probably phytosterol), m.p. 126—128°, was isolated as acetate. A. L.

**Constituents of *Crataegus oxyacantha*, L. H.** DIETERLE and O. DORNER (Arch. Pharm., 1937, 275, 428—437).—Crataegusic acid is shown by hydrolysis and resynthesis to be æsculin. Its extraction from the bark and berries of *C. oxyacantha*, L., is described. The berries contain phlobaphens, a saponin, and an oil, f.p. 14—15°, acid val. 32.7, sap. val. 169.1, ester val. 136.4,  $d$  0.9172. The bark contains  $H_2C_2O_4$  (no other org. acids), phlobaphens, and an oil, f.p. 16—17°,  $d$  0.923, which yields oleic, stearic, palmitic, and myristic acid. R. S. C.

**Isolation of *p*-coumaric acid from green tea.**—See A., II, 377.

**Proteins of Indian foodstuffs. X. In-vitro digestion of globulins from aconite bean (*P. aconitifolius*, Jacq.) and Bengal gram (*Cicer arietinum*, L.).** K. BHAGVAT (J. Indian Inst. Sci., 1937, 19, A, 67—73; cf. A., 1936, 913).—The rate of digestion of these globulins with trypsin, as indicated by the rate of appearance of total and  $NH_2-N$ , arginine (I), tyrosine, tryptophan, and diketopiperazine rings in solution, is that of caseinogen. Peptic digestion is more rapid than tryptic. The globulins contain 15.73 and 20.22% of (I), respectively. E. C. S.

**Nutritional chemistry of flowers. I. Vitamins and proteins in wistaria flowers (*Krauhia floribunda*, Taub., var. *typica*, Mak.).** K. KONDO and S. SHINANO (Bull. Agric. Chem. Soc. Japan, 1937, 13, 467—472).—Wistaria flowers contain protein conjugated with carbohydrates and colouring matter, together with vitamins-*d*, -*B*, and -*E*. J. N. A.

**Saponins of Chinese drug San-ch'i, *Aralia bipinnatifida*.**—See A., II, 384.

**Sesquicryptol, a sesquiterpene alcohol in essential oil of Japanese Suji (*Cryptomeria japonica*, Don) leaves.**—See A., II, 381.

**Hydroxytriterpene acids from Somali incense.**—See A., II, 382.

**Constitution of the scoparoside (scoparin) of *Sarothamnus scoparius*.**—See A., II, 347.

**Vegetable heart poisons. Oleandrin.**—See A., II, 369.

**Glucosides of the oleander.**—See A., II, 369.

**Optically active salsoline and two new alkaloids of *Salsola Richteri*.**—See A., II, 394.

**Alkaloids of *Veratrum album*. I.**—See A., II, 394.

**Physiology of sheep tapeworm, *Moniezia expansa*.** R. A. WARDLE (Canad. J. Res., 1937, 15, D, 117—126).—The longevity and  $H_2O$  and polysaccharide contents of *M. expansa* in various nutrient saline media indicate that these media are unsuitable for tapeworm cultivation *in vitro*. E. M. W.

**Zones of oxidation in the living cell demonstrated by the cobalt salt method.** P. JOYET-LAVERGNE (Compt. rend., 1937, 204, 1588—1590).—The chondriosomes and nucleoli of the epidermal cells of different plants and certain animal cells oxidise Co salts so that the regions concerned acquire a green stain. J. L. D.

**Use of buffered solutions in staining: theory and practice.** R. CRAIG and C. WILSON (Stain Tech., 1937, 12, 99—109).—The importance of  $p_H$  in staining with Fe hæmatoxylin, malachite-green, and eosin Y is emphasised. A method for staining in alcoholic buffer solutions is given. E. M. W.

**X-Ray intensifying screens in structure analysis.**—See A., I, 479.

**Colorimetric determination [of cholesterol] by the Liebermann-Burchard reaction.**—See A., II, 360.

**Determination of tyrosine in vegetable substances.** Y. RAOUL (Bull. Soc. Chim. biol., 1937, 19, 846—858).—The material is extracted with  $EtOH$  and then with  $Et_2O$ , and hydrolysed with 20% aq. NaOH. Tryptophan is pptd. with  $HgSO_4$  and the tyrosine determined colorimetrically after addition of aq.  $NaNO_2$ . A. L.

**Comparative determination of nitrogen by the "Dumas" and Kjeldahl methods.** I. ALQUIER and M. SIROT (Bull. Soc. Sci. Hyg. Aliment., 1937, 25, 48—69).—The vals. obtained by the two methods on blood, flour, etc. differ by  $\pm 4.5\%$ , those with the Dumas method being slightly too high, those with the Kjeldahl slightly too low. Conditions for ensuring the greatest accuracy in the latter method are laid down. E. C. S.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

OCTOBER, 1937.

**Respiration in the dog. I. Alveolar air and respiratory data.** J. ROOS and C. ROMIJN (*Arch. Néerland. Physiol.*, 1937, **22**, 233—256).—In female, but not in male, dogs under physiological conditions, the last portion of tidal air is alveolar air. By compressing the thorax at the end of a normal expiration, alveolar air can usually be obtained. During pregnancy and the 5 weeks following parturition, the  $\text{CO}_2$  content of the alveolar air is approx. 0.6% <, and the  $\text{O}_2$  content >, the normal val. The coeff. of ventilation is subject to large individual variations. A method of determining vital capacity and supplemental, complementary, and residual air is described.

W. McC.

**Fractionation of the output of the heart and of the oxygen consumption of normal unanæsthetised dogs.** S. E. LEVY and A. BLALOCK (*Amer. J. Physiol.*, 1937, **118**, 368—371). R. N. C.

**Alterations of alveolar carbon dioxide in man accompanying postural change.** R. J. MAIN (*Amer. J. Physiol.*, 1937, **118**, 435—440). R. N. C.

**Effects of inhalation of helium mixed with oxygen on the mechanics of respiration.** A. L. BARACH and M. ECKMAN (*J. Clin. Invest.*, 1936, **15**, 47—61).—He decreased the effort of the respiratory musculature and lowered intrapleural pressure.

CH. ABS. (p)

**Theophylline-ethylenediamine [euphyllin] in Cheyne-Stokes respiration.** O. A. S. MARAIS and J. MCMICHAEL (*Lancet*, 1937, **233**, 437—440).—The effect of euphyllin (I) in restoring periodic breathing to normal is due mainly to the  $(\text{CH}_3\cdot\text{NH}_2)_2$  component, but (I) may act when  $(\text{CH}_3\cdot\text{NH}_2)_2$  fails. Theophylline alone has no action.

L. S. T.

**Toxicity of air exhaled by man.** M. I. GRAMENITZKI and I. I. SIVERTZEV (*J. Physiol. U.S.S.R.*, 1935, **19**, 1265—1270).—Replacement of ordinary by exhaled air weakens the activity of the isolated frog heart. In addition to  $\text{CO}_2$  other volatile substances, probably basic, are concerned. Air exhaled by old or sick persons is more toxic than that of young and healthy individuals.

CH. ABS. (p)

**Oxygen and carbon dioxide content of the arterial and venous blood of normal subjects.** J. M. LOONEY and E. M. JELLINEK (*Amer. J. Physiol.*, 1937, **118**, 225—231).—The normal mean val. of venous  $\text{O}_2$  in samples collected by the method of Looney and Childs (see A., 1934, 314) is < the accepted vals., whilst venous  $\text{CO}_2$  is higher. The levels of  $\text{O}_2$  and  $\text{CO}_2$  in both arterial and venous blood from the same subject vary widely at different times.

R. N. C.

**Gases in blood during muscular work. I.** N. N. BLOCHIN (*J. Physiol. U.S.S.R.*, 1935, **19**, 1258—1264).  
CH. ABS. (p)

**Physical structure of the red cell membrane, with special reference to its shape.** E. PONDER (*Trans. Faraday Soc.*, 1937, **33**, 947—954).—The conditions causing transformation of mammalian red cells from disc to spherical form suggest that the normal disc shape is due to the action of surface components. The optical properties of the red cell envelope can be attributed to lipins and proteins, showing positive and negative birefringence, respectively, and it is inferred that the envelope comprises layers of protein particles with their long axes oriented tangentially, and interspersed lipid micelles with their optical axes oriented radially.

J. W. S.

**Relationship between the permeability of the red cell and its metabolism.** W. WILBRANDT (*Trans. Faraday Soc.*, 1937, **33**, 956—959).—Photoelectric investigation of the permeability of human erythrocytes shows that after a suspension of human blood (1 c.c.) in aq. NaCl (0.95%) + NaF (0.02N) (10 c.c.) has been kept at 37° for a few hr. its time of osmotic hæmolysis in isotonic glycerol solution is lengthened relative to that of a suspension in 1% aq. NaCl. The permeability for glycerol is unchanged, but the equilibrium is shifted considerably. The decrease in cell vol. shows that the shift in osmotic resistance is due to decrease in the amount of osmotically active substance in the cell. Evidence that the effect of NaF is due to a change of metabolism of the cells is summarised.

J. W. S.

**Permeation of human erythrocytes by anions and cations.** M. MAIZELS (*Trans. Faraday Soc.*, 1937, **33**, 959—964).—The relative permeation of anions into human erythrocytes has been determined by suspending the centrifuged cells in solutions containing equiv. amounts of KCl and another K salt (K<sub>4</sub>). After 5 min. the suspension was centrifuged and the  $[\text{Cl}']$  and  $[\text{A}']$  were determined. At  $p_{\text{H}}$  7 the permeation of inorg. ions follows the order  $\text{I}' > \text{CNS}' > \text{NO}_3' > \text{Cl}' > \text{SO}_4'' > \text{PO}_4'''$ . The least polar org. anions permeate most readily. The cells are almost impermeable to cations in salt solutions, but cation loss occurs in glucose solution. This loss cannot be restored in salt solutions and is due to a disturbance of a surface layer of ions or other constituent of the cell membrane.

J. W. S.

**Base binding in erythrocytes.** M. MAIZELS and J. L. H. PATERSON (*Biochem. J.*, 1937, **31**, 1642—1656).—Titration data for 0.55% aq. hæmoglobin

(I) indicate an isoionic point of  $p_H$  7.12–7.15 at 25° and a mol. buffering power of 7.9–9.1 for the  $p_H$  range of 8.4–7.2 [mol. wt. of (I) taken as 67,000]. The  $p_H$  of washed, dialysed cell solutions is 0.3, and of anæmic cells 0.4–0.5, < that of pure aq. (I). In erythrocytes, part of the cation is combined with  $Cl^-$  and  $HCO_3^-$  and part (approx.  $\frac{1}{3}$ ) with (I) and unknown, non-dialysable, probably complex ions, the latter being increased in anæmia. An increase in osmotic pressure of anæmic cells due to increased  $Cl^-$  and base contents does not occur owing to the increased  $H_2O$  content (A., 1936, 876). F. O. H.

**Action of pterins and other substances on the composition of the blood of young animals suffering from dietary anæmia and of adult rats.** R. TSCHESCHE and H. J. WOLF (Z. physiol. Chem., 1937, 248, 34–40; cf. this vol., 11).—Xanthopterin, erythropterin, leucopterin, guanopterin, and tyrosine (but not lactoflavin) exhibit the anti-anæmic effect (increase of erythrocyte and reticulocyte content). The active material obtained by the method of Subbarow *et al.* (A., 1936, 364) consists chiefly of xanthine (which is inactive) admixed with anti-anæmic material. The substance obtained by the method of Subbarow *et al.* (this vol., 8) is inactive.

W. McC.

**Action of nitrite on hæmoglobin in the absence of oxygen.** J. BROOKS (Proc. Roy. Soc., 1937, B, 123, 368–382).—In the presence of a reducing agent  $NaNO_2$  forms with hæmoglobin (I) a compound showing the same absorption bands as the NO-(I) complex (II), 1 mol. of  $NaNO_2$  completely reacting with 1 equiv. of reduced (I) at  $p_H$  5.15–6.63. The rate of reaction decreases with rising  $p_H$  and is very slow at  $p_H$  7.16–7.75. In the absence of both  $O_2$  and reducing agent 1 mol. of  $NaNO_2$  combines with 2 equivs. of reduced (I) yielding 1 equiv. of (II) and 1 equiv. of methæmoglobin. The latter is not formed in the reaction between NO and reduced (I). (II) is a Fe compound of the same type as oxyhæmoglobin and CO-hæmoglobin. A. G. P.

**State of carbon dioxide in solutions containing hæmoglobin.** R. MARGARIA, P. ROWINSKI, and S. GOLDBERGER (Arch. Sci. biol., 1933, 18, 378–384; Chem. Zentr., 1936, i, 3698).—The solubility const. of  $CO_2$  in such solutions deviates from the Henderson-Hasselbalch formula, varying with concns. of hæmoglobin,  $HCO_3^-$ , and dissolved  $CO_2$ ; this is ascribed to formation of a  $CO_2$ -hæmoglobin compound. H. N. R.

**Action of hæmoglobin on ascorbic acid. State of combination of ascorbic acid in erythrocytes.** M. FISCHER (Biochem. Z., 1937, 292, 16–24; cf. Gabbe, this vol., 326).—Oxyhæmoglobin (I) combines with ascorbic acid (II), which is liberated by treating the complex with CO,  $CO_2$ , or KCN. (II) also combines to a slight extent with CO- and  $CO_2$ -hæmoglobin, with cryst. and reduced hæmoglobin, and with (I) in presence of KCN. After intravenous injection of large doses of (II), the complex appears in the blood.

W. McC.

**Green derivative of hæmoglobin.** S. EDL-BACHER and A. VON SEGESSER (Naturwiss., 1937, 25, 461–462).—When guinea-pig erythrocytes are in-

cubated in a stream of  $O_2$  under PhMe at 38° with neutralised ascorbic acid (I) and  $PO_4^{'''}$  buffer ( $p_H$  7.2) a green froth appears after 30 min. and the whole liquid becomes deep green after 2 hr. After a short boiling with  $2N-H_2SO_4$  the green colour may be extracted with  $C_6H_5 \cdot OH$ . The amorphous deep green residue obtained after removal of solvent gives a Gmelin reaction similar to that of biliverdin (II). The possible identity of the green pigment with (II) suggests that (I) may play a role in the formation of bile pigments. W. O. K.

**Green derivative of hæmoglobin.** S. EDL-BACHER and A. VON SEGESSER (Naturwiss., 1937, 25, 557).—The formation of the pigment (see preceding abstract) is not influenced by the addition of NaF,  $As_2O_3$ ,  $H_2AsO_4$ ,  $MnSO_4$ , or  $CoCl_2$ , but is restricted by  $CN^-$ .  $CuSO_4$  facilitates so remarkably as to suggest a fundamental enzyme containing Cu. H. W.

**Iron. XIII. State of combination and physiological significance of "easily eliminated" iron.** G. BARKAN and O. SCHALES (Z. physiol. Chem., 1937, 248, 96–116; cf. this vol., 4).—The fractions *E* and *E'* (which differ only in the state of oxidation of their Fe) of the "easily eliminated" Fe of blood are pseudohæmoglobins and are probably intermediates in the physiological conversion of blood-pigment into bile-pigment, the oxidative cleavage of the porphyrin ring being followed successively by conversion of *E* into *E'* ( $Fe^{II} \rightarrow Fe^{III}$ ) and breakdown into bilirubin (I), Fe, and globin. *E'* combines with HCN (dil. HCl does not remove Fe from the complex produced) and is converted into *E* by reduction with  $Na_2S_2O_4$ . Conversely *E* yields *E'* on oxidation. *E*, but not *E'*, reacts with CO. The Fe of green hæmin (II) (Warburg and Negelein, A., 1930, 1199) is as easily eliminated as is the "readily eliminated" Fe of blood but CO does not inhibit Fe removal from (II). Hæmoglobin of blood solutions becomes green on successive addition of KCN and  $H_2O_2$ . The green substance easily loses Fe but, after reduction, loss of Fe is inhibited by CO. Human plasma contains equimol. amounts of Fe and (I). W. McC.

**Sulphæmoglobinæmia, its cause and prevention. Treatment with sulphanilamide.** H. E. ARCHER and G. DISCOMBE (Lancet, 1937, 233, 432–435).—The intracorporeal sulphæmoglobinæmia associated with the administration of drugs derived from  $NH_2Ph$  results from the combination of hæmoglobin with the  $H_2S$  absorbed from the intestinal tract, a reaction catalysed by the drug circulating in the blood. The normal absorption of the products of protein digestion in the small intestine is reduced by purgation, causing increased putrefaction in the colon, and production of  $H_2S$  greatly in excess of the normal. Saline cathartics such as  $MgSO_4$  are the most active in this process. L. S. T.

**Relation of protein to hæmoglobin building.** P. B. PEARSON, C. A. ELVEHJEM, and E. B. HART (J. Biol. Chem., 1937, 119, 749–763).—Hæmoglobin (I) regeneration in rats with nutritional anæmia was investigated. With adequate amounts of Fe and Cu, liver, caseinogen, ovalbumin, and soya-bean oil-meal produced good (I) regeneration and growth. Rat's

blood afforded excellent (I) regeneration but the growth response was inconsistent. Maize gluten meal and wheat gluten were poor for both growth and (I) regeneration. Gelatin and gliadin were inadequate for growth and gave very poor (I) regeneration. The results indicate that the maintenance of normal (I) vals. is more vital than growth. J. L. C.

**Electrophoresis of [blood-]platelets.** O. PINOTTI (Arch. Fisiol., 1937, 37, 97—100).—Micro-electrophoresis of plasmatic suspensions of platelets of various animals indicates that their surface potential is due to absorption of plasma-proteins (I) to an extent dependent on the character of (I); the nature of the charge is independent of dilution. F. O. H.

**Electrophoresis of serum-globulin. II. Electrophoretic analysis of normal and immune sera.** A. TISELIUS (Biochem. J., 1937, 31, 1464—1477).—An improved electrophoresis apparatus (described), in which the potential gradient is greatly increased, permits rapid and complete separation of proteins and other high-mol. compounds into their components. The migrating boundaries are observed by a method depending on  $n$ . Serum is separable into albumin and three globulins:  $\alpha$ ,  $\beta$ , and  $\gamma$ . The mol. wt. of these globulins is the same but the isoelectric point of the  $\alpha$ - and  $\beta$ -forms is at  $p_H$  5.1 and of  $\gamma$  at 6.0. The mobilities are quite different especially at alkaline reactions. Investigation of a highly potent anti-ovalbumin serum from rabbit showed that the antibody function migrated with the  $\gamma$ -globulin only (cf. this vol., 111). P. W. C.

**Isoelectric point of human serum-albumin.** E. KYLIN (Acta med. scand., 1936, 87, 536—550; Chem. Zentr., 1936, i, 3709—3710).—Cataphoresis of serum at  $p_H$  4.6 separates the albumin into two fractions, one moving to each electrode. The anode fraction has an isoelectric point at 4.0 and the cathode fraction at 5.5. A. G. P.

**Retention of trichloroacetic acid by human serum-proteins.** W. L. DULIERE and R. MINNE (Compt. rend. Soc. Biol., 1937, 125, 1040—1042).—Approx. 17% of the acid retained (550 mg. per g. of protein) is combined with the protein, the remainder being absorbed or occluded. H. G. R.

**Titrimetric determination of the proteins in human serum.** W. L. DULIERE and R. MINNE (Compt. rend. Soc. Biol., 1937, 125, 1042—1044).—The protein is calc. from the quantity of  $CCl_3 \cdot CO_2H$  retained in the coagulum after pptn. (cf. preceding abstract). H. G. R.

**Precipitation of serum-proteins by ammonium sulphate. Significance of fractionation at various concentrations of the salt.** A. ROCHE, L. SAMUEL, and R. ARTHAUD (Compt. rend. Soc. Biol., 1937, 125, 1061—1064).—If the protein concn. is >1% the solubility of the individual proteins is altered. The optimum conditions for pptn. of the globulin are seven-fold dilution of the serum and pptn. by half-saturation with  $(NH_4)_2SO_4$  at  $p_H$  5.7 and 22°. H. G. R.

**Protein-bound sugar and blood-proteins in normal and pathological conditions.** H. BIERRY

(Compt. rend., 1937, 204, 1681—1683; cf. this vol., 164).—In man glucose + mannose (from plasma protein-bound sugar) is > the glucosamine content of plasma-proteins in many pathological states. This information may lead to the recognition of the association of individual proteins with sp. diseases. J. L. D.

**Preparation of fibrinogen from human blood.** E. KYLIN and F. PAULSEN (Acta med. scand., 1936, 87, 442—453; Chem. Zentr., 1936, i, 3709).—Plasma in Ringer or physiological saline is placed in a U-electrolytic cell. Protein possessing all the properties of fibrinogen is isolated from the cathode liquid. The existence of oppositely charged fibrinogen fractions is discussed. A. G. P.

**Formation of fibrinogen. (A) In blood-plasma. (B) With reference to antibody production in plasma by the reticulo-endothelial system.** P. CAMPELLONE (Arch. Fisiol., 1937, 37, 101—124, 143—155; cf. A., 1936, 355).—(A) The action of injected dyes, As, and erythrocytes in increasing the fibrinogen (I) content of blood (dog, cat) is discussed with reference to the reticulo-endothelial origin of (I).

(B) The formation of both (I) and sp. antibodies is related to the activity of the reticulo-endothelial system. F. O. H.

**Factors influencing permanency of colloids in [blood-]circulation. I. Dyes and the coagulability of blood.** A. CESTARI (Boll. Soc. ital. Biol. sperim., 1937, 12, 237—239).—Dyes (both electro-positive and -negative) injected into heparinised animals remain longer in circulation than in normal animals. F. O. H.

**Demonstration of a masked form of nitrogen specific to conditions of histolysis.** J. LOISELEUR [with R. COLLIARD and C. CROVISIER] (Bull. Soc. Chim. biol., 1937, 19, 1059—1081).—When blood contains polypeptides, particularly under those pathological conditions in which histolysis occurs, much polypeptide is adsorbed by the plasma-proteins during pptn. with  $CCl_3 \cdot CO_2H$ . This polypeptide fraction can be recovered by elution and gives a measure of the degree of histolysis. It can be utilised for following changes of histolysis, e.g., under treatment by radiotherapy. P. W. C.

**Chromogenic tungstate and its use in determination of uric acid of blood.** E. B. NEWTON (J. Biol. Chem., 1937, 120, 315—329).—The prep. of a highly chromogenic Li arsenotungstate is described, and the method in which it is used as a reagent for determination of uric acid (I) in blood is given and its advantages are discussed. It is necessary to separate (I) from other reactive substances in blood-filtrates. J. N. A.

**Progressive lipidosis. I. II. Separation of free cellular lipins. III. Free liver-phospholipins of guinea-pigs poisoned by diphtheria toxin.** C. CIACCIO (Boll. Soc. ital. Biol. sperim., 1937, 12, 217—218, 218—219, 220—221).—I. The origin and distribution of cell-lipins are discussed. II. The tissue is frozen, sliced, and extracted with

anhyd.  $\text{Et}_2\text{O}$  at  $0^\circ$ , the extract being purified by, *e.g.*, washing with cold dil. aq.  $\text{CCl}_3\cdot\text{CO}_2\text{H}$ .

III. The content is significantly increased.

F. O. H.

Regressive lipidosis. IV. Lipidosis due to diphtheria toxin in relation to body-temperature. V. Hepatic lipidosis due to diphtheria toxin after preventive treatment with colloidal silver. A. BASILE and F. ALFANO (Boll. Soc. ital. Biol. sperim., 1937, 12, 224—225, 226—227).—IV. During the injection in pigeons and rabbits, a high body-temp. is accompanied by a tendency to decreasing hepatic lipidosis and *vice versa*.

V. Treatment of rabbits with colloidal Ag diminishes lipidosis due to P poisoning but not that due to diphtheria toxin.

F. O. H.

Variations in lipæmia of normal subjects. E. B. MAN and E. F. GILDEA (J. Biol. Chem., 1937, 119, 769—780).—Serum-lipins in 10 normal subjects were examined for periods up to 4 years. Serum-cholesterol varied by 31, -lipin-P by 23, -fatty acids by 37, and -proteins by 14%. The variations in lipins were not related to concn. of the blood, slight changes in body-wt., menstrual cycle, or season of the year.

J. L. C.

Blood-cholesterol during experimental hypercholesterolaemia in normal and splenectomised animals. A. LUCAS (Arch. Farm. sperim., 1937, 64, 130—136).—The hypercholesterolaemia, due to ingestion of cholesterol (I), in splenectomised rabbits is more marked and of longer duration than in normal rabbits. The histology of the spleen of the latter indicates it to be an organ of (I) deposition.

F. O. H.

Colour reaction of hexoses and polyhexoses: application to colorimetric determination of glucose in blood. J. A. SANCHEZ (Semana méd., 1935, II, 914—917).—Addition of 15 c.c. of  $\text{H}_2\text{SO}_4$  to 5 c.c. of a glucose solution containing  $>0.0001$  mg. produces an intense red coloration under the influence of the heat of mixing. The colour is given by hexoses and polyhexoses only and  $\propto$  their concn. Serum is treated with  $\text{CCl}_3\cdot\text{CO}_2\text{H}$ , filtered, diluted to 5 c.c., and after addition of 15 c.c. of  $\text{H}_2\text{SO}_4$  is heated at  $100^\circ$  for 5 min. The colour is compared with standards prepared with deproteinised blood after incubation at  $37^\circ$  for 24 hr. The test is applicable to oxalated plasma but not to citrated serum.

CH. ABS. (p)

Distribution of glucose between blood cells and serum. K. A. KLINGHOFFER (Amer. J. Physiol., 1937, 118, 431—434; cf. Neuwirth; this vol., 248).

R. N. C.

Fermentable reducing substances (true blood-sugar) of the internal fluid of invertebrates. M. FLORKIN (Bull. Soc. Chim. biol., 1937, 19, 990—999).—A table summarises the total and the fermentable reducing substances of the plasma of the coelomic fluid and of the blood-plasma of a large no. of invertebrates.

P. W. C.

Glycolytic power of human blood. N. SABATINI (Pathologica, 1935, 27, 787—789).—Effects of various drugs (atropine, Synergen) on the vegetative

nervous system do not indicate that the system influences glycolysis *in vitro*.

CH. ABS. (p)

Determination of pyruvic acid in small quantities of blood. S. DE JONG and J. PICARD (Arch. Neerland. Physiol., 1937, 22, 117—122).—The author's modification of the Clift and Cook method (this vol., 103) is preferred to that of Dische and Robbins (A., 1934, 1016), which is not sp.

H. G. R.

Determination of alcohol in blood. K. WREDE and B. KRATZ (Chem.-Ztg., 1937, 61, 669—671).—In legal cases the determination of  $\text{EtOH}$  in blood should be entrusted only to competent chemists. A sufficiently large blood sample should be taken to ensure accuracy. The errors to which Widmark's method are liable, due, *e.g.*, to the possible presence of  $\text{COMe}_2$  and  $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$  in the blood, are briefly discussed; doubtful results should be confirmed by an independent method, *e.g.*, that of Kionka.

A. B. M.

Chemical composition of blood of dairy cattle. II. Effect of phosphorus intake on the calcium and inorganic phosphorus content of whole blood of dairy heifers during first gestation and lactation. A. H. V. LANDINGHAM, H. O. HENDERSON, and G. A. BOWLING (J. Dairy Sci., 1936, 19, 597—609).—With Holstein heifers, an intake of 11.8 g. of P (1.2 g. per 100 lb. live wt.) daily maintained the blood-inorg. P at normal level. At parturition the inorg. P decreased suddenly, especially with heifers on low-P diet. Combined milk production and low intake of P lowered the blood-inorg. P but low P had no effect on blood-Ca. P in the feed should exceed total P excretion in milk by 10 g. per day per 1000 lb. live wt.

W. L. D.

State of mineral substances in blood-serum. II. Quantitative relationships between calcium and anion-forming constituents, protein, inorganic phosphoric acids, and carbonic acid in normal ox-serum. L. SEEKLES (Arch. Neerland. Physiol., 1937, 22, 93—107; cf. this vol., 84).—Various formulæ based on the law of mass action fail to express the diffusible Ca (measured by ultrafiltration experiments) in serum. The following empirical formula agrees with experimental data; [total protein + inorg. P]  $\times$  [% diffusible Ca] =  $(6.838 \pm 0.493) \times 10^{-1}$  at  $p_H$  7.3. As the inorg. P plays only a subordinate role it can be neglected and the const. becomes  $(5.443 \pm 0.466) \times 10^{-1}$ .

W. O. K.

Seasonal variation of serum-calcium in dogs. J. CHEYMOL and A. QUINQUAUD (Compt. rend. Soc. Biol., 1937, 125, 941—943).—Max. vals. were observed in spring and autumn irrespective of the sex of the animal.

H. G. R.

Changes in the plasma and cells during experimental human salt deficiency. R. A. McCANCE (Biochem. J., 1937, 31, 1278—1284).—Experimental salt deficiency in man produced by diet and sweating led to a fall in serum-Na and -Cl.  $\text{K}^+$ ,  $\text{Cl}^-$ , and possibly  $\text{Na}^+$  pass from the red blood cell to the plasma. The vals. for serum-proteins, hæmoglobin, and cell vol. of the whole blood increase. Restoration of a free NaCl intake causes these vals. to sink below their initial levels.

J. L. C.

**Photo-electric determination of potassium in minute quantities of serum.** W. S. HOFFMAN (J. Biol. Chem., 1937, 120, 57—61).—A photo-electric modification of the Jacobs-Hoffman colorimetric method (A., 1932, 102) is described. Slight alterations in the reagents and washing procedures are also recorded. R. M. M. O.

**Determination of water content of blood.** I. A. SMORODINCEV and L. M. REIN (J. Appl. Chem. Russ., 1937, 10, 1140—1141).—10 ml. of blood are distilled with 100 ml. of  $H_2O$ -saturated PhMe, and the amount of  $H_2O$  separating from the distillate is measured. R. T.

**Acid production in the functioning heart under conditions of ischæmia and of congestion.** R. M. MOORE and M. M. GREENBERG (Amer. J. Physiol., 1937, 118, 217—224).—Ligation of the coronary arteries in the dog and cat causes a fall of  $p_H$  and a rise of lactic acid in the coronary venous blood. Ligation of the cardiac veins scarcely affects coronary venous  $p_H$ . R. N. C.

**Effect of alkalisation of drinking water on the  $p_H$  of jugular blood of feeder cattle.** P. GERLAUGH, C. H. HUNT, and B. H. EDGINGTON (Ohio Agric. Exp. Sta. 53rd Ann. Rept. Bull., 1935, No. 548, 78).— $H_2O$  containing 1%  $NaHCO_3$  increased jugular blood  $p_H$  by 0.14 and 0.17 units but had no influence on the occurrence of disease. CH. ABS. (p).

**Rate of evaporation in serum as a measure of vapour pressure, osmotic pressure, and concentration of solutes.** R. W. CULBERT, D. J. McCUNE, and A. A. WEECH (J. Biol. Chem., 1937, 119, 589—906).—Comparison is made of data obtained, by the Hill method of measuring v.p., from 53 samples of human sera, with determinations of total base, non-protein-N, and protein. Analysis of the data by the method of multiple correlation indicates that a high degree of correlation exists between the measured rate of evaporation and the total v.p. and osmotic pressures of the sera. Regression equations are given relating the various quantities. F. A. A.

**Hæmolysis by various substances which liberate hydrochloric acid.** H. MAGNE and H. TRIMBACH (Bull. Soc. Chim. biol., 1937, 19, 1082—1091).—A method is given for measuring the degree of hæmolysis by HCl and by substances which not only effect hæmolysis but also attack the liberated hæmoglobin.  $COCl_2$ ,  $S(CH_2CH_2Cl)_2$ , and  $N(CH_2CH_2Cl)_3$ , HCl hæmolyse only to the extent that they liberate HCl. If the acid is neutralised as formed by buffering or if hydrolysis to give HCl is prevented by the presence of the other hydrolysis products, hæmolysis does not occur. P. W. C.

**Tissue extracts and blood coagulation.** F. R. DAVISON (Amer. J. Physiol., 1937, 118, 633—640).—Clotting does not occur with tissue extracts if the thrombin mechanism is interfered with, or when purified tissue extracts, Ca, and purified fibrinogen are mixed. The clotting reported with tissue extracts is considered to have been due to impurities in the reagents. R. N. C.

**Effect of variations in total calcium concentration on the coagulation time of blood.** M. M. CRANE and H. N. SANFORD (Amer. J. Physiol., 1937, 118, 703—707).—The time is practically const. when total Ca lies between 5 and 20 mg. per 100 c.c., but is considerably prolonged if Ca is  $<2.5$  mg. The relation between Ca and coagulation time is not affected by variations in plasma-proteins. R. N. C.

**Problems of asymmetry in processes of immunity.** M. SCHOEN (Ann. Ferm., 1937, 3, 30—51).—A crit. review.

**Reactions of hæmolysins on immunisation with blood mixtures.** J. MAGERL (Z. Immunitats., 1937, 90, 327—338).—After immunisation of rabbits with blood mixtures multivalent hæmolysins were found. Mixtures of sheep and horse bloods proved more efficient than either alone or blood of other animals. Six days after the last injection the titre decreased, but rose again after injection of chicken blood; yeast had no such effect. C. R. S.

**Variability of the properties of tetanus antitoxin.** G. RAMON, E. LEMÉTAYER, and I. PIROSKY (Compt. rend. Soc. Biol., 1937, 125, 967—970).—Neutralisation of the toxin by antitoxin from an animal injected with sp. anatoxin previous to hyperimmunisation is much more rapid than when no previous treatment is given. H. G. R.

**Intrinsic antigenic value and immunising power of staphylococcus anatoxin.** G. RAMON, R. RICHOU, and M. ROUCHDI (Compt. rend. Soc. Biol., 1937, 125, 970—974).—The immunising and therapeutic activity of staphylococcus anatoxin cannot be evaluated precisely *in vivo* as a function of the intrinsic antigenic power. H. G. R.

**Chemical nature of so-called syphilis antigens. I. Elimination of an inactive fraction.** Ö. FISCHER (Z. Immunitats., 1937, 90, 348—352).—Alcoholic extracts from bovine hearts treated with 20% of  $H_2O$  and 0.01N-HCl gave a ppt. which showed no reaction with serum of lues. From the liquid an antigen could be extracted with light petroleum. C. R. S.

**Immunising fractions isolated from *Hæmophilus pertussis*.** J. C. CRUICKSHANK and G. G. FREEMAN (Lancet, 1937, 233, 567—570).—An antigenically active fraction with immunising potency in mice apparently equal to that of whole bacterial cells from a virulent phase I strain has been isolated. The fraction contains no intact protein, and can be stored as a readily sol. powder. L. S. T.

**Distribution of ash in spodograms of normal human skin.** G. RIVELLONI (Boll. Soc. ital. Biol. sperim., 1937, 12, 144—146).—The spodograms (cf. Barigozzi, this vol., 167) of various cutaneous tissues are correlated with their histological characteristics. F. O. H.

**Mineral substances of chromosomes of the salivary glands of *Diptera* in relation to the probable distribution of genetic factors.** C. BARIGOZZI (Boll. Soc. ital. Biol. sperim., 1937, 12, 208—209).—Spodograms (cf. this vol., 167) of sections of the glands of *Chironomus thummi* were examined. F. O. H.

**Composition of the liver-fats of some New Zealand farm animals.** T. P. HILDITCH and F. B. SHORLAND (Biochem. J., 1937, 31, 1499—1515).—Methods of separating phosphatide and glyceride lipins are investigated. Data for various fractions of the liver-lipins of ox, cow, pig, and sheep are tabulated. The non-phosphatide fatty acids are characterised by the presence of 5—10 mol.-% of hexadecenoic acid (I) and 5—15 mol.-% of highly unsaturated  $C_{20-22}$  acids, the proportions being > those in depot fats; the two types of fat are otherwise similar. The phosphatides are characterised by their content of stearic and unsaturated  $C_{20-22}$  acids whilst that of (I) is diminished; the fatty acids also tend to have a higher mol. wt. Linoleic acid is absent from the liver-fatty acids of ox and cow but traces occur in those of pig and, together with linolenic acid, of sheep.

F. O. H.

**Wax of white pine cherms.**—See A., II, 398.

**Cholesterol in rabbit's skin during experimental hypercholesterolaemia.** G. G. VILLELA (Compt. rend. Soc. Biol., 1937, 125, 1097—1098).—The skin-cholesterol is increased.

H. G. R.

**Molecular structure of horse muscle-glycogen.**—See A., II, 400.

**Water-insoluble form of acetylcholine in the central nervous system.** O. LOEWI (Naturwiss., 1937, 25, 461).—Only a small fraction of the acetylcholine (I) present in the central nervous system can be extracted with Ringer's solution containing eserine. A larger quantity is obtained from the  $H_2O$ -insol. residue, by extraction with EtOH or EtOH-HCl. Whereas the  $H_2O$ -sol. (I) is insol. in  $Et_2O$ , the  $H_2O$ -insol. variety from the central nervous system is  $Et_2O$ -sol.

W. O. K.

**Constitution of octopine, a nitrogenous substance from the muscle of *Octopoda*.**—See A., II, 403.

**Melanins. I. Photosynthetic melanins.** M. SPIEGEL-ADOLF (Biochem. J., 1937, 31, 1303—1310).—Tryptophan, phenylalanine, and tyrosine on irradiation under suitable conditions with light of short  $\lambda$  formed melanins which were isolated and purified and showed slight differences in solubility, in reaction with  $H_2O_2$ , and in optical absorption, the extinction coeffs. decreasing for the melanins of the  $NH_2$ -acids above in the order given.

P. W. C.

**Determination of proline in protein hydrolysates.** R. ENGELAND and A. BASTIAN (Bull. Soc. Chim. biol., 1937, 19, 1126—1128).—The method consists of methylation and conversion of the formed stachydrine into platinichloride and aurichloride.

P. W. C.

**Trypsin-peptone ("tryptone").** F. ITZIOKA (J. Biochem. Japan, 1937, 25, 329—337).—Caseinogen, hydrolysed as far as possible by kinase-activated pancreatic juice (rabbit) at  $p_H$  7.5, yields a peptone (tryptone) (I), the pptn. reactions of which are described. (I) is further hydrolysed by pancreatic macerate-juice, liver, kidney, and mucosa of the small intestine at slightly alkaline reactions (with kidney, also at  $p_H$  4.5), the hydrolysis being due to peptidases.

F. O. H.

**Chemical nature of acid groups of proteins.** M. LISSITZIN (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 75—81).—Acidity of casein is ascribed to the presence of aminodicarboxylic acids.

CH. ABS. (p)

**Determination of [amino-acid] coefficient  $D$ .** I. A. SMORODINOV and S. A. PAVLOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 487—490).—For the pptn. of proteins 100 c.c. of the solution are treated with 1%  $Al_2(SO_4)_3$  (25 c.c.) and 0.1N-KOH [ $x$  c.c., the amount required to neutralise the 25 c.c. of  $Al_2(SO_4)_3$  to bromothymol-blue as determined by previous test]. 50 c.c. of the filtrate are titrated with 0.1N-KOH in presence of phenolphthalein until a faint reddish colour develops ( $E$  c.c.). Alcohol (55 c.c. of 96%) is added and the titration is continued until the pink colour reappears ( $F$  c.c.). Coeff.  $D$  is calc. by the formula  $D = (F - E)/(125 + x)/125$  (cf. B., 1937, 82).

W. O. K.

**Adsorption of polypeptides by proteins. Behaviour of peptone in solution.** J. LOISELEUR (Compt. rend., 1937, 205, 93—94).—The protein-free filtrate from a solution of Witte's peptone (I) contains N, the amount of which increases as the concn. of (I) decreases. The total N is not determined, probably because part of it is adsorbed on the colloid.

J. L. D.

**Structure of protein monolayers. Protein films.**—See A., I, 511.

**"Anti-complex" of egg white.** S. S. PEROV (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 64—74).—Addition of alkali to dialysed egg-white causes a decrease in  $\gamma$  and an increase in  $\eta$ . The "anti-complex" thus indicated was not isolated.

CH. ABS. (p)

**Titration curves of amino-acid mixtures.** M. LISSITZIN and P. DIATSCHENKO (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 90—92).—Identical titration curves are obtained for a mixture of monoaminodi- and diaminomono-carboxylic acids in the proportions in which they occur in casein.

CH. ABS. (p)

**Stanek and Hausmann numbers of some "proto-acids."** I. LEONTEV and G. GLUCHAREV (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 93—101).—"Proto-acids" of casein, egg white, peas, and *Phaseolus aureus* yield approx. the same amounts of  $NH_3$ -,  $NH_2$ -,  $(NH_2)_2$ -, and humus-N (Hausmann's method) and consume the same amounts of  $HIO_3$  on oxidation by Stanek's method.

CH. ABS. (p)

**Chemistry of the neuroproteins. I. Amino-acid composition of various mammalian brain-proteins.** R. J. BLOCK (J. Biol. Chem., 1937, 119, 765—768).—Proteins prepared from the brains of man, monkey, ox, sheep, rat, and guinea-pig gave the following average vals.: N 13.6, histidine 2.4, lysine 4.3, arginine 5.1, cystine 1.4, tryptophan 1.2, and tyrosine 3.9%. All six brain-proteins contained approx. the same relative proportions of these  $NH_2$ -acids, although the abs. amounts varied.

J. L. C.

**Sulphur distribution of proteins.** K. BAILEY (Biochem. J., 1937, 31, 1396—1405).—For pure proteins, Lugg's modification (A., 1933, 266) of the

Folin-Marenzi method is advocated as a measure of total disulphide (I), and for the determination of cystine (II) by a sp. method, Lugg's modification (*ibid.*, 814) of Sullivan's method is recommended, provided that the (II) content of the protein is  $>0.5\%$ . For determination of methionine (III), a modification of Baernstein's method (A., 1936, 1282) was employed. In hydrolysates of edestin (IV) and gliadin (V), the S unaccounted for in terms of total (I) and (III) amounts to 6—7% of the total S. The S of wool and kemp is almost wholly attributable to (II) and (III). In scoured samples of wool and kemp, the (II) content is low probably owing to oxidation of the S-S linking. The (II) figure obtained for (IV) and (V) is always  $<$  that expected on the basis of its (I) content although (II) added to (IV) and (V) before hydrolysis is quantitatively determined by the methods employed. Hydrolysis of proteins in presence of pentose results in the production of large amounts of S-containing humin. The results are discussed in relation to the S distribution of the grass-proteins. W. O. K.

**Copper in liver-proteins.** Z. GRUZEWSKA and G. ROUSSEL (Compt. rend. Soc. Biol., 1937, 125, 957—958).—Albumin and globulin fractions, the former containing Cu, were obtained from the livers of sheep and calf embryos. H. G. R.

**Mercury and its salts in protein media.** L. CALLEGARI (Boll. Soc. ital. Biol. sperim., 1937, 12, 139—140).—Aq. ovalbumin dissolves 0.0075, 0.0225, and 0.034% of Hg, Hg<sub>2</sub>Cl<sub>2</sub>, and (yellow) HgO, respectively. The vals. are modified by addition of alkalis or oxidising or reducing agents. F. O. H.

**Crystalline protein with high lactogenic activity.** A. WHITE, H. R. CATCHPOLE, and C. N. H. LONG (Science, 1937, 86, 82—83).—The method of isolation from anterior lobe fractions of the pituitary is described. The X-ray diffraction pattern is given. The crystals, C 51.11, H 6.76, N 14.38, and S 1.77%, are hygroscopic. P is absent. The protein appears to be identical with the lactogenic hormone of the anterior pituitary. When injected daily at a 4 mg. level into hypophysectomised rats, it does not stimulate growth. L. S. T.

**Nature of paranuclein. II. Comparison of the peptic digestion products of various phosphoproteins. III. Interrelationship of its component fractions.** J. D. HERD (Biochem. J., 1937, 31, 1478—1483, 1484—1487).—II. Fractionation of the products obtained by peptic digestion of various phosphoproteins, viz., caseinogen, vitellin, ichthulin, and batrachiolin, showed that in each case peptic digestion was accompanied by the appearance of cleavage products of different N/P ratios with a higher % of P in the less sol. fractions. That the presence of P was responsible for the resistance to pepsin was confirmed by experiments with proteins phosphorylated by POCl<sub>3</sub>. Pseudonuclein is a loosely bound mixture of these resistant highly phosphorylated compounds.

III. The amount of paranuclein obtained from caseinogen is greatly increased by digestion at a  $p_H$  away from the optimum for digestion. Temp. has no effect. There is no evidence of any one const. fraction (cf. A., 1936, 1404). P. W. C.

Y\* (A., III.)

(A) Sheath components of giant nerve fibres of the squid. (B) Ultrastructure of nerve axoplasm. (C) Protein constituents of nerve axoplasm. R. S. BEAR, F. O. SCHMITT, and J. Z. YOUNG (Proc. Roy. Soc., 1937, B, 123, 496—504, 505—519, 520—529).—(A) Examination by polarised light shows the presence in the giant nerve fibre of a myelin-containing layer, similar to that of vertebrate fibres.

(B) The giant axons of the squid contain micelles having anisodiametric shapes as well as intrinsic crystalloidal structure. Immersion experiments indicate that the birefringence of axoplasm is too weak to be due to all the protein existing as well-oriented rodlet micelles. Supplementary data support the conclusion that the optical properties are determined by a small well-oriented fraction of the protein content.

(C) Pure axoplasm can be obtained from the giant axons of the squid. The protein isolated (neuronin) is a complex of several components. Its solubility and chemical properties are identical with those of proteins from other nervous tissue. E. M. W.

**Micro-determination of gelatin and collagen content of muscles from normal and dystrophic rabbits.** H. C. SPENCER, S. MORGULIS, and V. M. WILDER (J. Biol. Chem., 1937, 120, 257—266).—A micro-method for conversion of muscle collagen (I) into gelatin (II) and determination of (II)-N is described. The (I) content of the gastrocnemius, biceps femoris, and triceps brachii in growing rabbits, and also the % of total N in form of (II)-N, are independent of the age of the animal. With marked nutritional muscle-dystrophy, the muscles contain 2 to 2.5 times as much (I) as controls; in the early stages, (I) increases before any apparent external signs. J. N. A.

**Composition of the myosins and myogen of skeletal muscle.** K. BAILEY (Biochem. J., 1937, 31, 1406—1413).—The myosins (I) from the muscles of rabbit, dog, ox, or chicken have almost identical chemical composition and contain N 16.6—16.7 (of which 7.00—7.23 is amide-N), tyrosine (II) 3.22—3.38, tryptophan 0.76—0.84, S 1.06—1.12, methionine 3.35—3.43, and cystine (III) 0.72—0.85 or 0.58—0.74% according to the method employed. The (I) of fish or lobster contained slightly more (II) and (III) but were evidently of the same general type as those of mammals and birds. Rabbit's myogen differs considerably in composition from the above (I).

W. O. K.

**Thermoelastic properties of muscle and their molecular interpretation.** K. H. MEYER and L. E. R. PICKEN (Proc. Roy. Soc., 1937, B, 124, 29—56).—The effect of temp. change on the elastic force exerted by a stretched, unstimulated muscle at const. length is investigated. At small and large elongations the temp. coeff. is negative but at intermediate elongations is positive, the elastic force increasing more rapidly than the abs. temp. X-Ray studies show that the degree of orientation in the muscle substance is augmented by stretching and diminished by warming. A mol. interpretation of the viscous-elastic properties of muscle is given and supported by experimental evidence. The elastic

system of muscle behaves as if composed of two components, flexible protein chains forming a three-dimensional network and free chains in the meshes of this net.

P. W. C.

**Elastic properties of mother-of-pearl.** P. S. SRINIVASAN (Proc. Indian Acad. Sci., 1937, 5, A, 463—483).—The elastic properties of the mother-of-pearl of various species of molluscs have been measured. The distribution of conchyolin (the cementing protein) in *M. Margaritifera* is deduced from a consideration of the elastic modulus in terms of the elastic moduli of the component materials and their distribution.

F. J. L.

**Solubility of collagens.** E. FAURE-FRÉMIET and C. BAUDOUY (Bull. Soc. Chim. biol., 1937, 19, 1134—1136).—Most collagens can be dissolved in  $\text{HCO}\cdot\text{NH}_2$  (I) giving 1—2% solutions and the protein can be reprecipitated by dilution with  $\text{H}_2\text{O}$ , EtOH, or  $\text{COMe}_2$ . (I) will dissolve 16—28% of desiccated tendon and >81% of the fresh tissue. Dissolved collagen can also be recovered by dialysis against  $\text{H}_2\text{O}$ , when rigid gels are obtained.

P. W. C.

**X-Ray study of an intracellular protein.** G. CHAMPETIER and E. FAURÉ-FRÉMIET (Compt. rend., 1937, 204, 1901—1903).—The X-ray diffraction pattern (two circles of equidistances 10 and 4.6 Å.) of ascaradin (I) separating from a cooled solution shows it to be isotropic with the protein in the cytoplasm of the living cell. When dehydrated (I) is semi-cryst. Freshly pptd. (I) containing much  $\text{H}_2\text{O}$ , or (I) made into a paste with  $\text{HCO}\cdot\text{NH}_2$ , gives a pattern with three circles with equidistances of 10, 4.6, and 3.6 Å. which reverts to the above type as  $\text{H}_2\text{O}$  is lost. (I) is pptd. from solution in the non-cryst. condition, but later becomes semi-cryst.

J. L. D.

**Isoelectric point of fibroin of Chinese silk.** C. WANG and T. T. WOO (J. Chinese Chem. Soc., 1937, 5, 170—173).—The isoelectric point of the fibroin of Chinese mulberry silk is  $p_H$  2.4—2.6 and is probably independent of origin (cf. B., 1930, 653); the val. for Chinese tussah fibroin is  $p_H$  4.2—4.4.

J. G. A. G.

**Chemical nature of the granules in mast cells.** P. GOMARASCA (Boll. Soc. ital. Biol. sperim., 1937, 12, 182—183).—Staining tests indicate the presence of glucoproteins of a mucoid character.

F. O. H.

**Extraction from the meal-moth *Ephestia kuehniella* of the gene A-hormone producing dark-coloured eyes.** E. BECKER (Naturwiss., 1937, 25, 507).—From the black-eyed females of the meal-moth of constitution *AA*, an extract has been obtained which, on injection, brings about the darkening of the eyes of the red-eyed mutants (*aa*).

W. O. K.

**Casein, a mixture of several proteins.** P. M. BUGAI (Trav. Inst. Chim. Charkov, 1935, 1, 69—80).—Caseinogen may be separated electrophoretically or chemically into a no. of fractions of different solubility.

R. T.

**Action of sunlight on milk.** L. BURUANA (Biochem. J., 1937, 31, 1452—1458).—In milk sunlight brings about oxidation of unsaturated fat and also oxidation by catalytic dehydrogenation of the ascorbic acid (I) present. The former reaction is

independent of and the latter is responsible for the decolorisation of methylene-blue. The decolorisation is aided by oxidation of fat which produces the anaerobic conditions in the milk necessary for decolorisation to occur. Determination of substances oxidisable by (I) before and after exposure to sunlight gives (I) vals. comparable with those obtained by direct dichlorophenol-indophenol titration. With the exception of mare's milk, the milks examined did not contain reduced glutathione.

P. W. C.

**Characteristics of buffalo and sheep milk.** M. KOTSCHOPOULOS (Milch. Forsch., 1937, 19, 7—14).—Buffalo milk (total solids 17—18%) obeys Fleischmann's formula for calculation of total solids from fat % and *d*. Buffalo (74%) and sheep milk (76%) possess a higher  $\text{H}_2\text{O}$ -insol. fraction of ash than cow milk (63%). Buffalo milk gives a positive EtOH test, average  $\eta$ , and a normal distribution of microflora. Sheep's milk has high  $\eta$  and a higher EtOH-titration val. than cow's milk.

W. L. D.

**Effect of intravenous injections of sugar on the lactating cow.** W. R. BROWN, W. E. PETERSEN, and R. A. GORTNER (J. Dairy Sci., 1936, 19, 177—184).—Injections of glucose and fructose cause hypoglycæmia and of lactose, hyperglycæmia, and are of doubtful val. in studying lactose synthesis.

W. L. D.

**Intra-mammary duct injections in the study of lactose formation.** W. R. BROWN, W. E. PETERSEN, and R. A. GORTNER (J. Dairy Sci., 1936, 19, 243—256).—Such injections of glucose and lactose produced hyperglycæmia in cows, with a slightly increased lactose secretion. The amount of injected sugar must be large so that sufficient enters the blood to exhaust the increased supply of insulin or hypoglycæmia causing tremors will result. Diuresis follows the tremors. Colostrum is regarded as an equilibrium product of milk secreted normally rather than as a special secretion.

W. L. D.

**Factors influencing the acidity of fresh cow's milk.** W. J. CAULFIELD and W. H. RIDDELL (J. Dairy Sci., 1936, 19, 235—242).—With 811 samples from 60 cows the average acidity of each breed's milk was: Ayrshire 0.160, Holstein 0.161, Guernsey 0.172, and Jersey 0.179% (average of all breeds, 0.166%). Individual cows gave the range 0.098—0.295%. The acidity of colostrum was high for first-drawn but rapidly diminished subsequently. Milk from a group of 36 cows showed a gradual decrease throughout the lactation. The acidity fell markedly in the first and last months. Diurnal and monthly variations were not significant.

W. L. D.

**Influence of the preceding dry period and of mineral supplement on lactation.** P. T. D. ARNOLD and R. B. BECKER (J. Dairy Sci., 1936, 19, 257—266).—Max. yields from Jersey cows follow a dry period of 31—60 days whilst shorter periods or periods >91 days give lower milk yields. In 73 cases, the use of 2% of bone meal in the concentrates of a ration increased yields by 45% over those on low-Ca rations. The rate of decline in yield is influenced by the Ca content of the ration.

W. L. D.

**Determination of lactoflavin by fluorescence measurements.** G. C. SUPPLEE, S. ANSBACHER, G. E. FLANIGAN, and Z. M. HANFORD (J. Dairy Sci., 1936, 19, 215—220).—The prep. of pure lactoflavin (I) from a  $H_2O$ -sol. vitamin concentrate of milk is described. A method of determining (I) by comparing its fluorescence in suitably filtered ultra-violet light with that of a standard is described.  $1 \times 10^{-7}$  g. can be determined and  $5 \times 10^{-8}$  g. detected by this method. W. L. D.

**"Normal" lead [content] of cow's milk and milk preparations.** M. KASAHARA, S. I. NOSU, R. KAWAMURA, and H. FUJII (Jahrb. Kinderheilk., 1936, 147, 357—359; cf. A., 1936, 501).—In Japan, cow's milk normally contains 0.01—0.59 mg. of Pb per litre. The corresponding vals. for sterilised, skimmed, dried, and condensed milk are 0.3—0.46, 0.06—0.26 mg. per litre and 0.17—3.26 and 0.134—4.59 mg. per kg., respectively. W. McC.

**Flow and protein content of subcutaneous lymph in dogs of different ages.** R. HOLMAN (Amer. J. Physiol., 1937, 118, 354—358).—Lymph-protein does not vary significantly with age. R. N. C.

**Total carbon dioxide content of [cerebrospinal] fluid.** M. KASAHARA and I. YASUDA (Z. ges. Neurol. Psychiat., 1936, 154, 621—625).—In dogs, the  $CO_2$  content of the fluid and of the blood are greatly decreased by fasting or administration of HCl,  $H_3PO_4$ , or lactic acid and increased by administration of  $NaHCO_3$  or  $Na_2CO_3$ , the  $CO_2$  content of the blood being more rapidly affected than that of the fluid. W. McC.

**Seminal fluid. I.  $p_H$  of normal human seminal fluid.** V. ZAGAMI (Atti R. Accad. Lincei, 1937, [vi], 25, 268—277).—The fluid, at 18° and in absence of air, has  $p_H$  7.50—7.74 (mean 7.58); on keeping (up to 80 hr.) in absence and presence of air, the  $p_H$  decreases and increases, respectively, the spermatozoa dying only in the latter instance. F. O. H.

**Seminal vesicles of the goby. Chemistry and physiology of the vesicular fluid.** R. T. YOUNG and D. L. FOX (Proc. Nat. Acad. Sci., 1937, 23, 461—467).—The vesicular fluid of *Gobius minutus* consists mainly of secondary, and traces of primary, proteoses. It does not lengthen the life of the corresponding spermatozoa *in vitro*. E. M. W.

**Amylolytic activity of saliva in dogs.** R. DE MARCO (Arch. Fisiol., 1937, 37, 56—68).—The saliva has a slight amylolytic activity, that of mixed being > that of parotid saliva. Small variations occur during fasting, whilst the activity  $\propto$  the no. of epithelial cells present. F. O. H.

**Aqueous and mineral fraction of saliva during continuous secretion.** P. J. MUCHINA (Med. exp. Ukraine, 1935, No. 2, 74—89).—Continuous secretion from submaxillary glands in dogs was secured by cutting the spinal cord and injecting Ringer solution periodically. The decrease in total solids in successive fractions of the secretion was largely at the expense of the org. constituents. CH. ABS. (p)

**Colorimetric micro-determination of deoxycholic acid and cholic acid in bile.** Y. ABE (J. Biochem. Japan, 1937, 25, 181—191).—Both acids give a pink colour when heated with vanillin (I) and 89% aq.  $H_3PO_4$  ( $d$  1.750) whilst with (I) and 78% aq.  $H_3PO_4$  ( $d$  1.625) only cholic acid gives the colour reaction. A method of determination based on this phenomenon and tables for the application of the step-photometer are given. F. O. H.

**3-Hydroxy-7-ketocholanic and chenodeoxycholic acids in guinea-pig's bile.** I. IMAI (Z. physiol. Chem., 1937, 248, 65—68; cf. Iwasaki, A., 1937, II, 20).—The bile yields palmitic acid, taurine, chenodeoxycholic acid, and small amounts of 3-hydroxy-7-ketocholanic acid (acetate, m.p. 166—167°). W. McC.

**$\beta$ -Hyodeoxycholic acid from pig's bile.** T. KIMURA (Z. physiol. Chem., 1937, 248, 280—284; cf. Wieland *et al.*, A., 1933, 504; Windaus *et al.*, A., 1926, 723).—Pig's bile, after removal of  $\alpha$ -hyodeoxycholic acid and 3-hydroxy-6-ketoallocholanic acid, yields  $\beta$ -hyodeoxycholic acid (I) ( $\beta$ -3- $\alpha$ -6-dihydroxycholanic acid), m.p. 189—190°,  $[\alpha]_D^{25} +5.13^\circ$  in EtOH ( $K$  salt;  $Na$  salt,  $[\alpha]_D^{25} 5.45^\circ$  in  $H_2O$ ;  $Me$  ester). (I) with  $CrO_3$  in AcOH at room temp. gives  $\alpha$ -dehydrohyodeoxycholic acid, converted by 5% aq.  $Na_2CO_3$  at 100° for 3 hr. into  $\beta$ -dehydrohyodeoxycholic acid, which with  $PtO_2-H_2$  gives  $\beta$ -3- $\alpha$ -6-dihydroxyallocholanic acid. (I) with  $CrO_3$  in AcOH at 0° gives  $\beta$ -3-hydroxy-6-ketocholanic acid, m.p. 154° ( $Me$  ester, m.p. 146°), converted by 5% aq.  $Na_2CO_3$  (100°; 3 hr.) into  $\beta$ -3-hydroxy-6-ketoallocholanic acid. W. McC.

**Constitution of trihydroxy- $\delta$ -sterocholanic acid.**—See A., II, 420.

**3-Hydroxy-6-ketoallocholanic acid and synthesis of  $\alpha$ -3 : 6-dihydroxyallocholanic acid.**—See A., II, 420.

**Effect of pylorectomy on the strength of the acid secreted by the fundus.** C. M. WILHELMJ, F. T. O'BRIEN, and F. C. HILL (Amer. J. Physiol., 1937, 118, 505—509).—Pylorectomy in dogs causes a fall in the quantity of HCl secreted, but does not affect its concn. Partial gastrectomy results in the appearance of mucus containing much neutral Cl; the amount of mucus rises as HCl secretion falls. It does not appear in pylorctomised whole-stomach pouches. R. N. C.

**Acid inhibition of the intestinal and intragastric chemical phases of gastric secretion.** C. M. WILHELMJ, H. H. MCCARTHY, and F. C. HILL (Amer. J. Physiol., 1937, 118, 766—774).—The presence of 0.1N-HCl in the stomach does not affect the intestinal phase of acid secretion, but the acid on passing into the duodenum at once inhibits it completely. When the intragastric and intestinal phases are combined, 0.1N-HCl does not usually inhibit acid secretion. R. N. C.

**Preparation and biological assay of entero-gastrone.** J. S. GRAY, W. B. BRADLEY, and A. C. IVY (Amer. J. Physiol., 1937, 118, 463—476).—Active preps. of entero-gastrone are obtained by the following method. The duodenal mucosa of the pig

is extracted with 0.4% HCl and the extract saturated with NaCl. The ppt. is suspended in H<sub>2</sub>O and  $p_H$  adjusted to 5.5. The solution is boiled, filtered, and the ppt. re-extracted with H<sub>2</sub>O. The combined filtrates are pptd. with tannic acid, the ppt. is removed by centrifuge and decomposed with 60% COMe<sub>2</sub> and HCl. The insol. residue is removed by centrifuge and re-extracted with 60% COMe<sub>2</sub>. The active material is pptd. from the solution with further COMe<sub>2</sub>, washed with COMe<sub>2</sub> and MeOH, and dried. Fractionation by EtOH, isoelectric pptn. at  $p_H$  8.4, C<sub>6</sub>H<sub>5</sub>N or picric acid pptn., and PhOH extraction fail to purify it further. The extract exhibits an apparently sp. inhibitory action on gastric motility and secretion. R. N. C.

**Determination of urinary sulphur.** L. CALLEGARI (Boll. Soc. ital. Biol. sperim., 1937, 12, 140—141).—Free SO<sub>4</sub>'' is determined in urine (5 c.c.) by removing PO<sub>4</sub>'' as MgNH<sub>4</sub>PO<sub>4</sub>, adding N-BaCl<sub>2</sub>, pptg. excess of BaCl<sub>2</sub> as BaCrO<sub>4</sub>, and determining CrO<sub>4</sub>'' in the ppt. iodometrically. Combined and total S are determined by applying the above method to the urine after hydrolysis with HCl and oxidation of the conc. urine with HNO<sub>3</sub>, respectively.

F. O. H.

**Rapid [micro-]method for the direct determination of urea in urine.** S. W. COLE (Lancet, 1937, 233, 575—576).—A modification of the method previously given (A., 1931, 1444) is described.

L. S. T.

**Urine at hourly intervals after the administration of glycine.** M. ADAMS, M. H. POWER, and W. M. BOOTHBY (Amer. J. Physiol., 1937, 118, 562—568).—Human subjects fed with glycine show an increased excretion of creatine; the effects are similar for normal subjects and patients with muscular disorder. Excretion of S compounds and inorg. salts is unaffected. R. N. C.

**Presence of histidine in human urine.** H. GERTLER (Endokrinol., 1936, 17, 45—47; Chem. Zentr., 1936, i, 3712).—Histidine is usually detectable in the later but seldom in the earlier months of pregnancy. A. G. P.

**Presence of a substance similar to histamine in urine of pregnant women.** G. UNGAR and J. DUBOIS (Compt. rend. Soc. Biol., 1937, 125, 963—965).—Histamine, in quantities of 0.01—1.6 mg. per litre (as hydrochloride), was observed in approx. 50% of the patients, the max. frequency occurring in the middle of pregnancy. H. G. R.

**Urinary excretion of cholesterol.** A. BUTENANDT and H. DANNENBAUM (Z. physiol. Chem., 1937, 248, 151—154).—The isolation of cholesterol (I) (as acetate and benzoate) from men's urine is described. In healthy men the amount of (I) excreted daily is approx. 0.75—1.0 mg. W. McC.

**Sources of error in the determination of porphyrins in urine.** C. TROPP and A. HOFMANN (Biochem. Z., 1937, 292, 74—81).—Spontaneous loss of porphyrins (I), favoured by duration of preservation, warmth, exposure to light, and adsorption on the Ca and Mg salts of the sediment deposited, occurs in urine on keeping. When the Et<sub>2</sub>O extract of the

urine is washed with H<sub>2</sub>O to remove AcOH, a loss of (I) inversely  $\propto$  the Et<sub>2</sub>O vol. occurs. Losses are avoided by using fresh urine and an adequate vol. of Et<sub>2</sub>O. W. McC.

**Blood-sugar-raising substance in the urine of diabetic and non-diabetic patients.** S. C. WERCH and S. S. ALTSHULER (Amer. J. Physiol., 1937, 118, 659—663).—The urine of diabetic patients contains a hyperglycaemic agent in amounts varying with the severity of the diabetes; non-diabetic urines contain none, or only traces. The agent is thermolabile and non-ultrafilterable, but is probably not a protein. It is sol. in H<sub>2</sub>O and 60% EtOH, and is adsorbed by C and kaolin. R. N. C.

**Salt economy in humid heat.** C. DALY and D. B. DILL (Amer. J. Physiol., 1937, 118, 285—289).—The salt content of the sweat in moderate activity at moderate temp. is < under extreme laboratory and industrial conditions. Na and Cl fall after acclimatisation to humid heat has been established; K and N are not significantly altered. R. N. C.

**Anæmia produced by milk diets in young, growing rats in testing the activity of liver preparations.** H. J. WOLF and R. TSCHESCHE (Z. physiol. Chem., 1937, 248, 21—33; cf. this vol., 11).—In rats 3—4 weeks old, a diet consisting solely of goat's or cow's milk produces severe hypochromic anæmia. The erythrocyte and leucocyte [but not the hæmoglobin (I)] contents of the blood of such rats are increased by subcutaneous administration of liver preps., the min. active doses of which are thus determined. The erythrocyte, leucocyte, and (I) contents are also increased by giving minute amounts of Fe. W. McC.

**Experiences with a concentrated whole liver extract.** S. J. HARTFALL (Lancet, 1937, 233, 317—321).—Intramuscular injection of relatively small doses of a conc. liver extract (100 g. of whole liver yielding 1 c.c.) produced an adequate response in severe anæmia. The improvement obtained in cases of resistant hypochromic anæmia suggests a sp. stimulating effect of the prep. on the Fe metabolism. L. S. T.

**Stable ferrous sulphate mixture for the treatment of nutritional anæmia in young children.** H. M. M. MACKAY and L. E. JACOB (Lancet, 1937, 233, 570—572).—The effect of FeSO<sub>4</sub> on the hæmoglobin levels of Fe-deficient anæmic infants is recorded. L. S. T.

**Comparison of oral administration versus intraperitoneal injection of colloidal iron on blood regeneration in nutritional anæmia of the rat.** H. H. BEARD and T. S. BOGGESE (Amer. J. Physiol., 1937, 118, 211—216). R. N. C.

**Biochemistry of the anæmias.** I. Saponin anæmia and mineral constituents of the blood. G. STOLFI and C. BALDANZA. II. Tolylenediamine anæmia and carbohydrates. G. STOLFI and G. D'AROMA. III. Tolylenediamine and hæmorrhagic anæmias and mineral constituents of the blood. G. STOLFI and C. BALDANZA (Boll. Soc. ital. Biol. sperim., 1937, 12, 102—103, 172—173, 173—174).—I. Saponin anæmia increases [Cl'] of the blood,

plasma, and erythrocytes and  $[Na^+]$  of the serum in rabbits.  $K^+$  and  $Ca^{++}$  are variable whilst inorg. P is unchanged.

II. The anaemia (in rabbits) is accompanied by hyperglycaemia and diminution of liver-glycogen. Blood-glycolysis varies and, whilst the glucose consumed per unit vol. of blood decreases, that per erythrocyte increases.

III. Haemorrhagic anaemia in rabbits increases  $[Cl^-]$  of whole blood, plasma, and corpuscles. Serum- $Na^+$ ,  $-Ca$ , and  $-K$  are unchanged. With tolylenediamine anaemia, serum- $Cl$ ,  $-K$ , and  $-Ca$  increase whilst serum- $Na$  and plasma- and corpuscle- $Cl$  are practically unchanged. F. O. H.

Production of cancer by pure hydrocarbons.

IV. W. E. BACHMANN, J. W. COOK, A. DANSI, C. G. M. DE WORMS, G. A. D. HASLEWOOD, C. L. HEWITT, and A. M. ROBINSON (Proc. Roy. Soc., 1937, B, 123, 343—368; cf. A., 1935, 774).—The carcinogenic action of a no. of hydrocarbons is examined. The high potency of methylcholanthrene was not exceeded by that of any other substance examined although cholanthrene closely approached it. The introduction of substituents into position 5 of the 1:2-benzanthrene (I) mol. is favourable to carcinogenic activity. 1:2:3:4-, 7-methyl-1:2:3:4-, and 3:4:8:9-dibenzpyrene have considerable potency in producing epitheliomas in mice. Among compounds unrelated to (I), 2-methyl-3:4-benzphenanthrene showed notable cancer-producing activity. A. G. P.

Aminoethyl phosphoric ester—a compound apparently specific to malignant tumours. E. L. OUTHOUSE (Biochem. J., 1937, 31, 1459—1463).—Aminoethyl phosphate (I), m.p. 244° (corr.) (cf. A., 1936, 364) (quinine salt), could not be detected in pancreas, liver, placenta, or embryo but is present in malignant tumours, the average amount being 36 mg. per 100 g. A synthesis of (I) is given and the solubility of the Ba salt determined in  $H_2O$ -EtOH and in  $H_2O$ -MeOH. P. W. C.

Permanent experimental diabetes produced by pituitary (anterior lobe) injections. F. G. YOUNG (Lancet, 1937, 233, 372—374).—Daily administration of an extract produced permanent diabetes in two dogs, temporary in a third. One dog treated with insulin required 60 units (4.4 units per kg.) to maintain the urine practically free from glucose on a normal, high-protein diet. L. S. T.

Effect of gangliectomy on mineral composition of bone. A. FERRANNINI (Pathologica, 1935, 27, 777—780).—In dogs lumbar gangliectomy decreased the total ash and Ca and increased the Mg and (slightly) the P contents of the bones of the posterior extremities. CH. ABS. (p)

Blood-catalase during experimental hyperthermia and fever in man. I. SOLAROLI (Arch. Fisiol., 1937, 37, 69—96).—During febrile conditions, the blood-catalase (I) increases rapidly with increase in body-temp. and suddenly diminishes as the temp. commences to return to normal vals. The level of (I), however, is not related to the temp. F. O. H.

Idiopathic steatorrhea. A. M. NUSSBRECHER and F. MORTON (Brit. Med. J., 1937, 1152—1154).—In an adult case there was no bone decalcification in spite of persistently low serum-Ca. Absorption of fat and carbohydrate was probably inefficient but that of protein was normal. Edema associated with low serum-protein is discussed. A. G. P.

Pathogenesis of ketosis. Pregnancy disease of sheep. L. M. RODERICK, G. S. HARSHFIELD, and M. C. HAWN (J. Amer. Vet. Med. Assoc., 1937, 90, 41—50).—Glycogen (I) is withdrawn from the liver under conditions of an inadequate intake of carbohydrate and fat takes its place. (I) up to 9% is stored in the livers of foetal lambs and the demand in twin pregnancy is high. Fatty livers in ewes and lambs are produced by semi-starvation. Metabolism of carbohydrate is so reduced that fat oxidation cannot be carried beyond the stage of ketonic substances, these being formed in the liver. W. L. D.

Characteristic features of the milk of cows suffering from mastitis. E. PIJANOWSKI, J. SUPINSKA, and T. MATUSZEWSKI (Rocz. Nauk Roln. Lcsn., 1937, 38, 1—34).—A negative correlation is established between the lactose and  $Cl^-$ , and a positive one between the catalase, leucocyte, and  $Cl^-$ , contents of milk from cows suffering from mastitis. The bromothymol-blue test for diagnosis of mastitis is less trustworthy than that depending on determination of  $Cl^-$ . Bacteriological data are presented. R. T.

Rennet test for detection of mastitis. F. B. HADLEY (J. Dairy Sci., 1936, 19, 165—169).—5 ml. of milk and 0.1 ml. of diluted rennet ( $\times 50$ ) are kept at 22—28° for 1 hour. Samples which have not coagulated are abnormal. This simple test, compared with other tests for mastitis, gives results of equal significance. W. L. D.

Biochemical aspects of mental disorder. M. V. GOVINDASWAMY (Proc. Soc. Biol. Chem. India, 1937, 2, 11—16).—A lecture.

Chemistry of lipoidosis phosphatidica. P. H. TEUNISSEN (Z. physiol. Chem., 1937, 248, 142—150).—The accumulated lipins of the liver and spleen of a boy who suffered from Niemann-Pick disease consisted chiefly of lecithins and sphingomyelins. The liver had a greatly increased content of free cholesterol. The dried spleen of a person who suffered from Gaucher's disease contained 14% of kersasin. The lipin content of the organs is not affected by preservation for years in aq.  $CH_2O$ . W. McC.

Lipinaemia following abortion. E. M. BOYD (Endocrinol., 1937, 21, 292—294).—Incomplete abortion in women was associated with increased plasma-lipin as compared with those in the corresponding period of normal gestation. There was no change in the lipin content of the red cells. J. L. C.

Filterable calcium in late-pregnant and parturient women and in the new-born. M. ANDERSON and F. W. OBERST (J. Clin. Invest., 1936, 15, 131—133).—Average vals. for filterable serum-Ca in non-pregnant, late-pregnant, and parturient women

and in the new-born are const. Reported variations are due primarily to changes in total Ca.

CH. ABS. (p)

**Hypoadrenalism and pellagra: role of vitamin deficiency.** I. M. SOLARE (Brit. Med. J., 1937, 1249—1251).—The sp. val. of vitamin-B<sub>3</sub> in pellagra is questioned. A case of pellagra as a terminal manifestation of hypoadrenalism is cited. Functional hypoadrenalism, pellagra, and secondary pellagra probably have common aetiological factors. Relations between vitamin-C and the adrenal cortex are discussed.

A. G. P.

**Effect of iodine and inorganic and organic iodo-compounds on osseous lesions of experimental rickets.** R. LECOQ (Compt. rend., 1937, 204, 1891—1893).—Addition to the diet of 0.5% of I, 0.75% of KI, 2% of "iodocalcioformin," or 1% of iodinated oil of carnations cures rickets induced in young rats by a rachitogenic diet. Expressed as I, 0.4—0.5% is necessary in an antirachitic diet.

J. L. D.

**Variation in blood-uric acid during scarlatina.** E. DICKER (Compt. rend. Soc. Biol., 1937, 125, 1048—1049).—Blood-uric acid increased until the 25th day and then slowly decreased.

H. G. R.

**Effect of the plane of nutrition on the course of animal trypanosomiasis.** M. H. FRENCH and H. E. HORNBY (Ann. Rept. Dept. Vet. Sci. Tanganyika, 1934, 40—56).—The course of *T. congolense* disease is unaffected by planes of nutrition > those of maintenance.

CH. ABS. (p)

**Sodium chloride content of cerebrospinal fluid in tuberculous meningitis.** J. INGHAM (Brit. Med. J., 1937, No. 3993, 111—113).—The NaCl content (determination described) of spinal fluid in cases of tuberculous meningitis is rarely > 600 mg. per 100 c.c. Vals. < 550 mg. are found only in such cases.

A. G. P.

**Alkalosis with disordered kidney functions.** R. A. McCANCE and E. M. WIDDOWSON (Lancet, 1937, 233, 247—249).—A case report. The main cause of the uræmic state was probably a fall in glomerular filtration as referred to inulin. Other changes in clearances such as those of creatinine, urea, and K<sup>+</sup> are discussed. No increase in total serum-base or -Ca, and only a small increase in serum-Mg, was observed.

L. S. T.

**Mechanism of experimental uræmia.** M. F. MASON, H. RESNIK, jun., A. S. MINOT, J. RAINEY, C. PILCHER, and T. R. HARRISON (Arch. Int. Med., 1937, 60, 312—336).—Retention of substances antagonistic to Ca<sup>++</sup> in the cerebrospinal fluid, phenols, guanidine, and urea together with a disturbance of the acid-base balance were observed.

H. G. R.

**Proteolytic activity of the sera of dogs with experimental uræmia.** M. F. MASON and R. EYERS (J. Biol. Chem., 1937, 119, 735—739).—Serum from uræmic dogs has a greater proteolytic action on normal dog's fibrin than serum from normal dogs.

J. L. C.

**Extreme degree of leucocytosis in whooping-cough.** W. J. PEARSON and G. H. NEWNS (Lancet, 1937, 233, 254—255).—A case with unusually high

leucocyte count and a relative increase in the lymphocytes is reported.

L. S. T.

**Application of affinity to coupled biochemical reactions.**—See A., I, 468.

**Standard metabolism in the white mouse.** H. G. BARBOUR and J. TRACE (Amer. J. Physiol., 1937, 118, 77—86).

R. N. C.

**Tissue metabolism under the influence of (A) low oxygen tensions, (B) carbon monoxide.** H. LASER (Biochem. J., 1937, 31, 1671—1676, 1677—1682).—(A) The respiration of retina, chorion, allantois, liver, and tumour at 5—20% O<sub>2</sub> tension equals (excepting with liver) that at 100%, whilst the aerobic glycolysis is significantly increased and the R.Q. lowered. The effects are due to changes in enzymic activity.

(B) The respiration of the tissues in O<sub>2</sub>-CO equals that in O<sub>2</sub>-N<sub>2</sub> mixtures. Replacement of N<sub>2</sub> by CO, however, increases aerobic glycolysis, thus indicating inhibition of the Pasteur effect, an inhibition totally or partly reversed by exposure to light.

F. O. H.

**Respiratory quotient of renal tissue of Houssay dogs.** J. F. FAZEKAS, E. H. CAMPBELL, jun., and H. E. HIMWICH (Amer. J. Physiol., 1937, 118, 297—299).—Lactate is oxidised, but not glucose.

R. N. C.

**Direct determination of the renal blood flow and renal oxygen consumption of the unanæsthetised dog.** M. F. MASON, A. BLALOCK, and T. R. HARRISON (Amer. J. Physiol., 1937, 118, 667—676).

R. N. C.

**Simultaneous measurement of renal blood flow and excretion of hippuran and phenol-red by the kidney.** K. A. ELSOM, P. A. BOTT, and A. M. WALKER (Amer. J. Physiol., 1937, 118, 739—742).

R. N. C.

**Basal metabolism and urinary nitrogen excretion of Chinese, Manchus, and others of the Mongolian race.** F. G. BENEDICT, L. C. KUNG, and S. D. WILSON (Chinese J. Physiol., 1937, 12, 67—100).—High pulse and respiration rates generally coincided with a high metabolic level. The urinary N excretion per kg. of body-wt. was essentially the same as for Caucasians, and was the lower the older was the subject. The basal metabolism of the Chinese, taken as a whole, is < that of the Caucasian.

J. N. A.

**Creatinine, blood-sugar, and basal metabolism of soldiers.** A. DE NIEDERHAUSEN (Boll. Soc. ital. Biol. sperim., 1937, 12, 88—90).—Tabulated data show that residence in the tropics has no effect on endogenous N balance or carbohydrate equilibrium.

F. O. H.

**Basal metabolism of women over 35 years of age.** H. MCKAY and M. B. PATTON (53rd Ann. Rept. Ohio Agric. Exp. Sta. Bull., 1935, No. 548, 82).—The basal metabolic rate per unit wt. or surface area remains fairly uniform from 35 to 50 years and subsequently declines.

CH. ABS. (p)

**Effect of temperature, humidity, and other factors on the hatch of hen's eggs and on energy metabolism of chick embryos.** H. G. BAROTT

(U.S. Dept. Agric. Tech. Bull., 1937, No. 553, 45 pp.).—In the range 35.5–39.8° the energy metabolism and speed of hatching increased with rise of temp. Max. hatching occurred at 37.8° and the ill effects of temp. rise increased with deviations on either side of this optimum. Optimum hatching at 38.9° was observed with R.H. 58, and at 37.8° with R.H. 61%, the nos. hatching decreasing more and more rapidly as the R.H. deviated from the optimum. During the second half of the incubation period the energy metabolism was max. with optimum R.H. The metabolic rate and the no. of eggs hatching diminished with increasing  $[CO_2]$  (0.5–4.0%) in the incubator air.  $CO_2$  allowed to accumulate gradually during incubation was less injurious than when maintained at an intermediate level throughout. The optimum  $[O_2]$  for hatching was 21%; an increase in concn. was less harmful than a decrease of similar magnitude. The R.Q. and thermal quotient indicated a carbohydrate metabolism during the first few days of incubation and an almost exclusively fat and protein metabolism after the tenth day. A. G. P.

**Effect of ketogenic diet on the blood-sugar and respiratory quotient of children.** F. B. TALBOT and V. BATES (Amer. J. Dis. Children, 1935, 50, 827–839).—The R.Q. of children is lowered < that of adults by a ketogenic diet. Blood-sugar diminishes but the basal heat production is unaffected.

CH. ABS. (p)

**Coagulation defect in sweet clover disease and in the hæmorrhagic chick disease of dietary origin: source of prothrombin.** A. J. QUICK (Amer. J. Physiol., 1937, 118, 260–271).—Rabbits fed with spoiled sweet clover hay show a fall in plasma-prothrombin (I) which runs parallel with the hæmorrhagic tendency. (I) is raised temporarily by injection of citrated blood, but scarcely at all by defibrinated blood. Addition of 5% of lucerne (II) to the diet raises (I) to a level of safety. Chicks fed on a diet deficient in vitamin-K show a gradual fall of (I), which is restored to normal by (II). Sweet clover hay is considered to contain a principle that destroys (I), whilst (II) contains a factor promoting (I) synthesis, which is not identical with -K but may be related to it. A method for determination of (I) is described. R. N. C.

**Dietary factors influencing cardiac rigor in albino rats.** S. CHANG, M. C. PATRAS, and R. D. TEMPLETON (Amer. J. Physiol., 1937, 118, 423–430). R. N. C.

**Effect of a lysine-deficient diet on the œstrous cycle.** P. B. PEARSON (Amer. J. Physiol., 1937, 118, 786–791).—In the rat *d*-lysine restores the œstrous cycle which has ceased as a result of a diet containing gliadin as protein. R. N. C.

**Relation of dietary protein to sterility.** I. J. CUNNINGHAM, C. S. M. HOPKIRK, and M. M. CUNNINGHAM (New Zealand J. Sci. Tech., 1937, 19, 22–30).—An otherwise complete diet but with maize and oats as protein source caused good growth in rats but atrophy and non-functioning of the testes. Wheat-, rye-, and barley-protein gave normal development of

the testes. Small additions of animal protein and yeast to the maize rations prevent degeneration.

W. L. D.

**Effect of diet on the survival of adrenalectomised rats.** H. G. SWANN (Amer. J. Physiol., 1937, 118, 798–805). R. N. C.

**Duration of the digestion of different foods in the digestive tract of the dog.** J. ROOS and S. KOOPMANS (Arch. Neerland. Physiol., 1937, 22, 52–71).—The time of passage of the food through the gastro-intestinal tract was determined by ascertaining when potato-starch grains added to the diet appeared in the rectum. A flesh diet required a somewhat shorter time for passage than a mixed or brown bread diet if no liquid was given; when liquid was administered simultaneously, there was little difference in the times of passage. W. O. K.

**Specific dynamic action of butter-fat and of superimposed sugar.** J. R. MURLIN, A. C. BURTON, and W. M. BARROWS, jun. (J. Nutrition, 1936, 12, 613–644).—The average sp. dynamic action observed in human subjects was 4.74% of the fat-calories fed. The val. was unrelated to age but was influenced by the tolerance for (capacity to digest and to metabolise) fat. Feeding glucose or sucrose in addition to the high-fat meal produced two types of dynamic response, (a) quant. addition to the fat metabolism, (b) an increase > that due to feeding the same amount of sugar alone, and ascribed to additional fat metabolism. Part of the extra heat produced may result from ketone oxidation induced by the sugar (see following abstract). The sp. dynamic action of fat is not paralleled by blood-fat. A. G. P.

**Rate of ketogenesis in human subjects on high-fat diets, as influenced by different sugars.** J. R. MURLIN, E. S. NASSETT, W. R. MURLIN, and R. S. MANLY (J. Nutrition, 1936, 12, 645–670).—Addition of sucrose, fructose, or glucose to a high-fat diet reduced ketosis, the relative efficiency of the sugars varying with the dosage level. In no case was ketogenesis completely extinguished although the increase in carbohydrate was > sufficient according to Shaffer's theory. Sugar administered 3–5 hr. after the fat was less effective than when given 11–15 hr. after, and caused a smaller increase in carbohydrate combustion. This is attributed to replenishment of liver-glycogen (I) following stimulated production of insulin. Formation of (I) is as important as combustion in the antiketogenic action of sugars. A. G. P.

**Relative participation of proteins and fats in covering the energy during inanition.** S. SYNEPHIAS (Bull. Soc. Chim. biol., 1937, 19, 1037–1058).—The relative amounts of protein and fat utilised to supply energy requirements during starvation and after removal of glycogen stores vary considerably with the species, the proportion from protein being for the dog, rat, and guinea-pig 10%, for the pig 6%, for the rabbit 30%, and for man 15–20%.

P. W. C.

**Nutrition of Black Sea fishes.** L. V. ARNOLDI and K. R. FORTUNATOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 513–516).—The wt. curves and the food consumption and assimilation of various

fishes have been determined under aquarium conditions. W. O. K.

**Biological value of the proteins of soya bean, field pea, and *Lathyrus sativa* by the balance-sheet and growth methods.** K. P. BASU and M. C. NATH (Indian J. Med. Res., 1937, 24, 1001—1026).—The biological vals. of soya-bean proteins by the balance-sheet method at 5, 10, and 15% levels of protein in the diet are 64, 58, and 54% and those of the cooked product are 52, 50, and 47%, respectively. The vals. for field pea and *L. sativa* proteins at 10 and 15% levels are 48, 41, and 50, 44%, respectively. The high biological val. of the soya-bean proteins is confirmed by results obtained by the rat growth method. W. O. K.

**Effect of feeding dogs with vegetable "proto-acid."** I. LEONTEV (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 13—17; cf. A., 1936, 1143).—Replacement of protein by "proto-acids" of peas in the diet of young dogs did not affect the gain in wt. or the blood analysis nor produce evidence of rickets. CH. ABS. (p)

**Digestion of milk and of modified milk (A) *in vitro*; (B) *in vivo*.** D. FETTER and F. W. SCHULTZ (Amer. J. Dis. Children, 1935, 50, 1101—1106, 1107—1112).—(A) Untreated milk, lactic acid milk, evaporated and powdered milks are rapidly and completely digested at  $p_H$  4.5 by artificial gastric juice which contains rennin (I). In the absence of (I) digestion occurs only at  $p_H$  1.8—3.0.

(B) The time required to produce the max. concn. of sol. N in the gastric contents after ingestion of various forms of milk was greatest (1.5 hr.) in the case of untreated milk. CH. ABS. (p)

**Semi-synthetic diet for *Helix pomatia*.** N. H. HOWES [with R. B. WHELLOCK] (Biochem. J., 1937, 31, 1489—1498).—For investigation of the dietetics of *H. pomatia* the young snails soon after hatching are supplied with a semi-synthetic diet containing purified caseinogen, pure carbohydrate, an artificial salt mixture, leaf extract or cod-liver oil, and commercial cholesterol. Growth is almost as rapid as with control animals. Snails require vitamin-A or carotene, some or all of the constituents of the -B complex, but not chlorophyll. The requirement in respect to -D and cholesterol is not clearly defined. P. W. C.

**Fate of racemic amino-acids in the animal organism.** E. ABDERHALDEN and H. HANSON (Fermentforsch., 1937, 15, 274—284; cf. A., 1935, 654).—*L*-Histidine (I), fed to rabbits, is completely degraded but *d*-histidine (II) is scarcely affected. In pigeons, (II) does not produce disease when injected and after parenteral administration of (I) and (II) no histamine is found in the serum or plasma. W. McC.

**Metabolism of amino-acids in heart- and lung-tissues.** K. P. BASU and M. N. BASAK (Indian J. Med. Res., 1937, 24, 1117—1124).—Of various  $NH_2$ -acids tried, only *L*-cystine (I) and *L*-proline (II) undergo oxidative deamination in presence of thin slices of heart-tissue (rat), whilst the lung-tissue deaminates only (I). The deamination of (I) in both tissues is

not affected by KCN or octyl alcohol (III), but the deamination of (II) by heart tissue is completely inhibited by KCN and partly by (III). W. O. K.

**Creatine and creatinine metabolism. IV. Creatinine and creatine from ox-serum. V. Origin of urinary creatinine.** M. K. ZACHERL (Z. physiol. Chem., 1937, 248, 69—79, 80—84; cf. A., 1935, 654; Behre and Benedict, A., 1936, 1013; Goudsmit, *ibid.*, 1544).—IV. The serum contains pre-formed creatinine (I), isolated by deproteinising successively with EtOH and basic Pb acetate and pptg. with  $HgCl_2$ . After removal of (I) creatine is converted into (I) and so isolated.

V. In dogs and rabbits the (I) content of the renal vein is < that of the renal artery. (I) of the urine is probably derived from the blood. W. McC.

**Fate of guanidinoglyoxaline in the animal body.** M. MOHR (Z. physiol. Chem., 1937, 248, 57—64; cf. Hunter, A., 1936, 999).—When 4(or 5)-guanidinoglyoxaline (I) (*dipicrate*, m.p. 210—211° (uncorr.); *aurichloride*, m.p. >365°; *flavianate*), glyoxaline (II), and carnosine (III) are administered to dogs, the proportions recovered in the urine are 33, 7.6, and 0%, respectively. (III) is probably degraded chiefly to urea. (I) slightly increases the sugar content of the blood and temporarily diminishes its pressure. Equimol. mixtures of guanidine and (II) also diminish blood-pressure. No (I) is found in dog's urine following administration of guanine. The lethal doses of (I) for the mouse and dog are 0.15—1.0 g. and 40—50 mg. per kg., respectively. W. McC.

**Amino-acid metabolism. III. Fate of *dl*-leucine, -norleucine, and -isoleucine in the normal animal.** J. S. BUTTS, H. BLUNDEN, and M. S. DUNN (J. Biol. Chem., 1937, 120, 289—295; cf. this vol., 304).—*dl*-Leucine fed to rats did not give rise to glycogen (I), but formed ketonic substances which consisted of 65% of  $\beta$ -hydroxybutyric acid, 35% of  $COMe_2$ , and  $CH_3Ac \cdot CO_2Et$ . *dl*-Norleucine produced (I) and exhibited marked ketolytic properties. *dl*-isoLeucine formed a small amount of (I) and under certain conditions gave rise to ketonic substances. Possible mechanisms are discussed. J. N. A.

**Production of taurocholic acid in the dog.** R. W. VIRTUE and M. E. DOSTER-VIRTUE (J. Biol. Chem., 1937, 119, 697—705).—Administration of cystine or methionine [but not alanine or homocystine (I)] together with cholic acid to fasting dogs with biliary fistulae which had received cholic acid for several days increased the output of taurocholic acid in the bile. Most of the S of (I) was excreted in the urine as inorg.  $SO_4$ . J. L. C.

**Choline and its derivatives. VI. Presence of choline in biological substances. Choline of sperms. VII. Action of leech and frog muscle on quaternary ammonium compounds with an ester grouping.** E. KAHANE and J. LEVY (Bull. Soc. Chim. biol., 1937, 19, 959—975, 976—989).—VI. Free choline (I) is not present in sperms at the time of emission but arises subsequently under the action of an enzyme (secreted by the prostate) which

reacts with a substrate (not acetylcholine or lecithin) present in the spermatic secretion.

VII. The action of esters of (I) with  $\text{HCO}_2\text{H}$ ,  $\text{AcOH}$ ,  $\text{EtCO}_2\text{H}$ ,  $\text{BzOH}$ ,  $\text{HBr}$ , and  $\text{HNO}_3$ , of  $\beta$ -methylcholine with  $\text{AcOH}$ , and of the Et ester of betaine is greater with eserinated than with normal muscle of leech and frog, whereas with (I) carbamate there is no difference. The sensitivity to eserine runs parallel with the ability of the muscle pulp to hydrolyse these esters (cf. A., 1936, 875, 895, 1140). P. W. C.

Importance of cystine for the growth of fur of rabbits. A. I. DERAVLEV (Sherstjanol Delo, 1935, No. 4—5, 14—17).—Addition of cystine but not that of S to the diet increased the wt. and improved the quality of the fur. CH. ABS. (p)

Nitrogen: sulphur ratio of the whole organism of rats fed with cystine. E. LIPPMANN and U. DACHA (Boll. Soc. ital. Biol. sperim., 1937, 12, 195—197).—Administration of L-cystine increases the balance of S but not of N. Part of the increase in S balance cannot be accounted for and is possibly due to S metabolism of intestinal bacteria. F. O. H.

Metabolism of sulphur. VI. Oxidation in the body of the sulphur-containing amino-acids and some of their partially oxidised derivatives. G. MEDES (Biochem. J., 1937, 31, 1330—1346).—The rate of excretion and degree of oxidation of the S of a large no. of S-containing  $\text{NH}_2$ -acids and oxidised derivatives by a normal individual under standardised conditions are determined. The S of cysteine (I) and methionine was recovered in the urine as inorg.  $\text{SO}_4^{--}$  almost quantitatively within 16 hr. The rate of oxidation of cystine (II) was greatest when fed as the Li salt but was even then of (I). The rate of oxidation to  $\text{SO}_4^{--}$  followed the order (I) > (II) > cystine disulphoxide > cysteinesulphinic acid > cysteic acid, and this series cannot represent the path of oxidation to  $\text{SO}_4^{--}$ . Recovery of total S also decreased in the same order, suggesting that the S of the more highly oxidised members is more available for synthetic processes. The S of  $\alpha$ -hydroxy- $\gamma$ -methylthiolbutyric acid (hydroxymethionine) was recovered within 24 hr. to the extent of 95%, of which 83% was as inorg.  $\text{SO}_4^{--}$ , whereas that of  $\alpha$ -dihydroxy- $\gamma$ -dithiodipropionic acid (hydroxycystine) was only 25% recovered, of which 39% was as  $\text{SO}_4^{--}$ . All S of  $\text{CS}(\text{NH}_2)_2$  was excreted in 48 hr., 92% in org. form. P. W. C.

$\alpha$ -Guanidoglutaric acid, a possible precursor of creatine.—See A., II, 403.

Metabolism of purine-nitrogen in fish and batrachia. II. Catabolism of purine-nitrogen in Teleostei. A. BRUNEL (Bull. Soc. Chim. biol., 1937, 19, 1027—1036).—With a no. of Teleostei (*Esox*, *Cyprinus*, *Leuciscus*, *Scomber*, etc.) uric acid, allantoin, and allantoic acid are converted enzymically into urea, the liver containing uricase, allantoinase, and allantoicase (I) (cf. this vol., 344). With another group (*Salmo*, *Gadus*, *Conger*, *Anguilla*, etc.), (I) is absent and purine-N is degraded only to allantoic acid and not to urea. P. W. C.

Synthesis of uric acid in the organism of the bird. IV. Xanthine synthesis. W. REINDEL  
Y\*\* (A., III.)

and W. SCHULER (Z. physiol. Chem., 1937, 248, 197—204).—Xanthine (I) is obtained from  $\text{NH}_2$ -acids as source of N and an unknown source of C in presence of pigeon liver. Adenine and hypoxanthine are not intermediate steps in the syntheses of (I). H. W.

Degradation of histidine by ascorbic acid and thioglycollic acid. P. HOLTZ and G. TRIEM (Z. physiol. Chem., 1937, 248, 5—20; cf. A., 1937, II, 117; Edlbacher *et al.*, A., 1934, 920).—In presence of  $\text{O}_2$ , ascorbic acid and thioglycollic acid break the glyoxaline (I) ring of histidine (II), giving 1 mol. of  $\text{NH}_3$  and a labile intermediate from which a second mol. of  $\text{NH}_3$  is liberated by aq. NaOH. In acid media, the extent of degradation is such that twice as much  $\text{NH}_3$  is subsequently liberated by aq. NaOH as by aq.  $\text{Na}_2\text{CO}_3$ , the mechanism of the breakdown being the same as with liver-histidase. In neutral and alkaline media, the amount of  $\text{NH}_3$  liberated by aq.  $\text{Na}_2\text{CO}_3$  is >50% of that liberated by aq. NaOH.  $\text{H}_2\text{O}_2$ ,  $\text{O}_3$ , and ultra-violet light liberate 2 N from (II) as  $\text{NH}_3$  with production of a substance from which the third N is liberated by aq. NaOH. Isatin deminates the side-chain of (II) but does not break the (I) ring. The mechanism of the reactions is discussed. W. McC.

Intermediary metabolism of tryptophan. XXVII. Change of configuration of *d*-tryptophan in the animal body. Y. KOTAKE and S. GOTO [with T. HAMADA, K. TANAKA and Y. KOTAKE, jun.] (Z. physiol. Chem., 1937, 248, 41—56; cf. A., 1936, 1544).—*l*-Tryptophan (I), after bacterial conversion into indole, is colorimetrically determined by treatment with  $p\text{-NMe}_2\cdot\text{C}_6\text{H}_4\cdot\text{CHO}$  using a step photometer. Slices and (more vigorously) pulp of kidney and (especially) liver of rats and (less vigorously) mice convert *d*- into *l*-(I). Organs of some other animals act in the same way. Indolyl-pyruvic (II) and *l*(+)- [but not *d*(-)]-indolyl-lactic acid are converted by kidney into *l*-(I). In rats (but not in mice and rabbits), *d*-(I) has an anti-anæmic action equal to that of *l*-(I). The conversion of *d*- into *l*-(I) proceeds by way of (II). W. McC.

Xanthurenic acid. IV. Formation *in vivo* of xanthurenic acid from tryptophan. L. MUSAJO and F. M. CHIANCONE. VII. Chromatographic isolation of urinary indirubin. L. MUSAJO (Gazzetta, 1937, 67, 218—222, 235—238; cf. A., 1937, II, 305).—IV. The urine of guinea-pigs or rabbits fed with a sufficient amount of tryptophan (I) contains xanthurenic acid (II). When (I) is injected subcutaneously into rabbits, (II) is also excreted, with kynurenine. In no case does the administration of kynurenine acid (III) lead to excretion of (II); (III) thus cannot be an intermediate in the formation of (II) from (I) *in vivo*. Dogs fed on (II) do not excrete (III).

VII. The urine of rats or rabbits fed on a fibrin diet gives a red PhMe extract, from which the red substance is not adsorbed by sugar or  $\text{CaCO}_3$ . There is some adsorption on  $\text{Ca}(\text{OH})_2$ , but the best result is obtained with active  $\text{Al}_2\text{O}_3$ , which by chromatographic adsorption gives a zone containing indirubin, and another with traces of indigo. E. W. W.

**Formation of tyramine by animal tissue.** P. HOLTZ (Naturwiss., 1937, 25, 457).—Kidney tissue of rabbits or guinea-pigs or extracts of these tissues made with  $\text{PO}_4'''$  solutions convert tyrosine into tyramine. Muscle-, liver-, and pancreas-tissue give negative results. These findings have a bearing on the etiology of essential hypertension. W. O. K.

**Deamination of glycine by "omega" [catalyst].** E. ABDERHALDEN and E. BAERTICH (Fermentforsch., 1937, 15, 342—347; cf. Kisch, A., 1931, 1088).—The change produced in glycine when adrenaline (I) is added is due not to (I) itself but to the oxidation product "omega."  $\text{CH}_2\text{O}$  and (probably) glyoxylic acid are produced in addition to  $\text{NH}_3$ . W. McC.

**Absorption of lipins. I. Oleic acid in normal dogs. II. Oleic acid in phloridzinised dogs.** S. FILIPPON and L. BELLINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 135—136, 136—137).—I. Oleic acid (1 c.c.), introduced into the Vella fistula of a dog, is absorbed to the extent of 45%.

II. The absorption is at first greatly diminished but after continuous injection of phloridzin returns to normal vals. F. O. H.

**Chemical relationships of blood-cholesterol : cholesterol metabolism.** L. M. HURXTHAL and H. M. HUNT (Ann. Intern. Med., 1935, 9, 717—727).—High-fat diets of exclusively animal foods increase blood-cholesterol (I) and may be a factor in arteriosclerosis. Hypocholesterolaemia is common in xanthosis. Hyperthyroidism diminishes and hypothyroidism increases (I), which is also low in hypopituitarism and high if there are cholesterol deposits in the body.

CH. ABS. (p)

**Alimentary disturbance produced by fatty acids and soaps.** R. LECOQ (J. Pharm. Chim., 1937, [viii], 26, 56—62).—22% of castor oil (I) in a diet fed to pigeons causes no inconvenience (cf. A., 1936, 904). When the fatty acids of (I) alone, or with glycerol (II), or as their K salts are fed in corresponding amounts, the birds die of polyneuritis even when 3 g. of dried yeast are fed daily. Similar experiments with the fatty acids from olive oil and with a mixture of stearic, palmitic, and oleic acid (5 : 4 : 1) show that the addition of (II) or the use of the K salts provides some protection against polyneuritis. J. L. D.

**Liver function as tested by the lipæmic curve after intravenous fat administration.** A. NACHLAS, G. L. DUFF, A. C. TIDWELL, and L. E. HOLT, jun. (J. Clin. Invest., 1936, 15, 143—151).—Administration of  $\text{CCl}_4$  to dogs causes difficulty in removing fat from blood after intravenous injection, probably because of liver damage. The lipæmic curve after fat injection may serve in examinations of liver function.

CH. ABS. (p)

**[Biological] dehydrogenation of the cyclohexane ring.** K. BERNHARD (Z. physiol. Chem., 1937, 248, 256—276).—In dogs, *o*-, *m*-, and *p*-toluic acid, hexahydrobenzoyl derivatives of sarcosine and alanine, hexahydro-*o*-toluic acid (*cis*- and *trans*-), and 1 : 3 : 4 : 6-tetrahydroxyhexahydrobenzoic acid pass through the organism unchanged and the OH-, Me, Me<sub>2</sub>, and NH<sub>2</sub>-derivatives of cyclohexane are

retained or destroyed. Hexahydrobenzoic acid and the *N*-Me and -Me<sub>2</sub> derivatives of its amide, hexahydrohippuric acid, and cyclohexylpropionic acid are converted into BzOH and/or hippuric acid but cyclohexylacetic acid is converted chiefly into succinic acid, no  $\text{CH}_2\text{Ph}\cdot\text{CO}_2\text{H}$  being found in the urine. Hexahydro-*m*-toluic acid is converted into *m*-toluic acid whilst the corresponding *p*-acid is partly dehydrogenated. It follows that appreciable dehydrogenation of the cyclohexane ring in the dog occurs only when the ring contains  $\text{CO}_2\text{H}$  or a group readily converted into  $\text{CO}_2\text{H}$  and that the presence of *o*-Me prevents the dehydrogenation. W. McC.

**Carbohydrate metabolism during experimental human salt deficiency.** R. A. McCANCE (Biochem. J., 1937, 31, 1276—1277).—Experimental salt deficiency produced by diet and sweating gave an increase over normal vals. for blood-sugar in fasting subjects and 2 hr. after ingestion of 50 g. of glucose.

J. L. C.

**Variation in the glycogen content of edible oysters.** H. BERRY, B. GOUZON, and C. MAGNAN (Compt. rend., 1937, 204, 1895—1897).—The glycogen (I) content of the liver and pancreas and of the genitalia of *Ostrea edulis* and *Gryphea angulata* is a max. in December and remains at a high level for several weeks. The adductor muscles and mantle are low in (I). The actual (I) content varies considerably from species to species. J. L. D.

**Biochemistry of carbohydrates. XXV. De-toxication of ingested naphthalene and excretion of [conjugate with] uronic acid.** H. MASAMUNE (J. Biochem. Japan, 1937, 25, 299—305).—The urine from rabbits fed with  $\text{C}_{10}\text{H}_8$  yielded in one case  $\alpha$ -naphtholglycuronic acid and in all others a substance (I),  $\text{C}_{15}\text{H}_{16}\text{O}_7\cdot\text{H}_2\text{O}$ , m.p. 154—156° ( $\text{Ac}_3$  derivative, m.p. 145°), hydrolysed ( $\text{N}\cdot\text{H}_2\text{SO}_4$ ) to  $\alpha\text{-C}_{10}\text{H}_7\text{OH}$  and a pentaauronic acid [phenylosazone, m.p. 120—122° (decomp.)] (*Ba* salt, m.p. 211°). No conjugate of  $\beta\text{-C}_{10}\text{H}_7\cdot\text{OH}$  was detected. (I) was hydrolysed by emulsin. F. O. H.

**Pancreatectomy in the pig.** F. D. W. LUKENS (Amer. J. Physiol., 1937, 118, 321—327).—The fasting glucose excretion after pancreatectomy is very slight or non-existent, and the fasting N excretion is low. Ingested carbohydrate is excreted quantitatively. There is a marked ketonuria, but no accompanying severe acidosis. Pituitary extracts cause acidosis and increase serum-lipins. R. N. C.

**Hexose diphosphate metabolism of normal tissue extracts.** C. A. MAWSON (Biochem. J., 1937, 31, 1657—1670).—Dialysed extracts of blood, brain, kidney, liver, muscle, spleen, and testis of mice and rats, in presence or absence of glutathione (I) and at 38° or 50—55°, do not convert glucose into lactic acid (II) but, with the exception of blood, form small amounts of (II) from hexose diphosphate (III) at 50—55°, especially in presence of (I); at 38°, the action is slight and not influenced by (I). (I) is effective at concns. >0.0027%. The action on (III) at 50—55° is increased by dilution of the extract. Rapid formation of alkali-labile  $\text{PO}_4$  esters from (III) occurs in liver extract at 52° in presence of citrate or  $\text{HCO}_3'$ .

buffer; this formation and the amount of inorg.  $\text{PO}_4^{'''}$  produced are unaffected by (I), whilst in absence of (I)  $\text{AcCHO}$  is not produced. With tissue extracts heated at  $51^\circ$  for 30 min., the enzymic activity remains in the uncoagulated portion. (I) cannot be replaced by cysteine. The mechanism of the above reactions is discussed.

F. O. H.

**Effects of glucose, fructose, and galactose on ketosis produced by anterior pituitary extract and by pancreatectomy.** D. E. CLARK and J. R. MURLIN (J. Nutrition, 1936, 12, 469—490).—In dogs with ketosis due to prolonged high-fat diet and injection of anterior pituitary extract, the ketolytic action and also the N-sparing effect of galactose (I), fructose (II), and glucose (III) decreased in the order named. In depancreatized dogs (I) and (III) had approx. the same ketolytic effect. (II) showed no action within 8 hr. of ingestion. The N-sparing action of (II) and (III) was  $>$  that of (I).

A. G. P.

**Comparative effects of glucose, sucrose, and fructose on ketone production in phloridzinized dogs.** W. R. MURLIN and R. S. MANLY (J. Nutrition, 1936, 12, 491—508).—With large doses (50 g.) the ketolytic action of glucose (I) is  $>$  that of sucrose in phloridzinized dogs. With 15 g. doses the effect of (I) is  $>$  and with 25 g. doses = that of fructose. The N-sparing effect and the ketolytic action of the sugars are not parallel. Ketolytic action is preferably based on measurements of "ketone production," a combination of ketonuria and ketonemia. Suitable formulæ are given.

A. G. P.

**Ketosis. XII. Effect of choline on ketonuria of fasting rats following a high-fat diet.** H. J. DEUEL, jun., S. MURRAY, L. F. HALLMAN, and D. B. TYLER (J. Biol. Chem., 1937, 120, 277—288; cf. this vol., 306).—Administration of choline (I) to rats on a high butter-fat diet prevents accumulation of fat in the liver; during subsequent fasting, there is considerable infiltration of fat into the liver. The ketonuria level is lower during the first 2 fast days and higher during the next 3 days in rats previously fed the (I)-butter-fat diet than in the controls. Administration of (I) during fasting to rats which had had only the butter-fat diet did not alter the ketonuria during the first 3 days, but lowered it significantly in the males on the 4th and 5th days. The liver-fat also decreased more rapidly in rats which received (I) during the fast. Addition of (I) during inanition period to the diet of rats previously receiving (I)-butter-fat diet significantly lowered the ketonuria, and also prevented infiltration of fat into the liver. Hence (I) does not increase rate of fat oxidation; it prevents deposition of labile fat in the liver but cannot prevent deposition in tissues.

J. N. A.

**Antiketogenic action of glucose in the absence of insulin.** I. A. MIRSKY, J. D. HEIMAN, and R. H. BROH-KAHN (Amer. J. Physiol., 1937, 118, 290—296).—Intravenous injection of glucose in large amounts in depancreatized dogs results in removal of blood-ketones (I); previous nephrectomy or phloridzinisation does not alter the effect, which is considered to be due to deposition of glycogen in the liver.

Blood-sugar (II) in the fasted depancreatized dog is depressed, and (I) increased, by phloridzin; (I) is inversely  $\propto$  (II). The degree of ketonuria gives no indication of the (I) content, although it changes with it. The metabolic disturbance in pancreatic diabetes is probably due to an alteration in the balance between glycogen storage and glycogenolysis; the associated production of (I) is then due to compensatory acceleration in the catabolism of fatty acids and proteins in the liver.

R. N. C.

**Ionic reaction and anaerobic metabolism of isolated muscle.** R. LIPPMANN and J. WÄJZER (Bull. Soc. Chim. biol., 1937, 19, 1019—1026).—Using pairs of muscles, with and without  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ , the decomp. of glycogen, creatinephosphoric acid, adenosinetriphosphoric acid, hexose monophosphate, etc. and the formation of lactic acid are investigated at various  $p_{\text{H}}$ . The results do not agree with those of Lipmann and Meyerhof (A., 1931, 117) and are discussed in respect to those of other workers.

P. W. C.

**Carbohydrate and phosphorus changes in prolonged muscular contractions.** J. SACKS, W. C. SACKS, and J. R. SHAW (Amer. J. Physiol., 1937, 118, 232—240).—Prolonged stimulation *in situ* of the muscles of cats at the rate of 1 twitch per sec. causes no formation of hexose phosphate (I) or hydrolysis of adenosine triphosphate (II). At a rate of 2 twitches per sec., (I) appears and (II) is hydrolysed before and after the "steady state" is reached, whilst formation of lactic acid (III) in the first min. is  $>3$  times as much as at the lower rate. Creatine phosphate is hydrolysed as (III) accumulates, and is resynthesised as (III) disappears. During the steady state, (I) that has previously accumulated in the muscle tends to disappear, and (III) is formed continuously in small amount, the rate of formation depending on the intensity of activity of the muscle.  $\text{H}_2\text{O}$  is absorbed in large amounts from the blood stream by the working muscle.

R. N. C.

**Internal exchange in glandular tissues.** A. M. UTEVSKI, E. I. KOVTUN, and K. M. SCHLEIFER (Med. Exp. Ukraine, 1934, No. 1, 32—37).—Glycolysis in glandular tissue differs from that in muscle. Glucose is a better generator of lactic acid (I) than is glycogen. Formation of (I) is favoured by the presence of pyrotartrates or alanine.

CH. ABS. (p)

**Blood- and muscle-lactic acid in the steady state.** J. SACKS and W. C. SACKS (Amer. J. Physiol., 1937, 118, 697—702).—Lactic acid (I) in the plasma of the venous blood issuing from the muscle of the cat or rabbit in the steady state of activity is significantly  $<$  in the muscle itself, and remains lower in the early part of the recovery period. It is hence impossible to calculate an "oxidative quotient" for (I) in man on the basis of changes of blood-(I), and also unnecessary to postulate an "alactacid" mechanism for anaerobic performance of work.

R. N. C.

**Rate of lactic acid removal in exercise.** E. V. NEWMAN, D. B. DILL, H. T. EDWARDS, and F. A. WEBSTER (Amer. J. Physiol., 1937, 118, 457—462).—Blood-lactic acid (I) is not usually increased in exercise at  $>12$  times the basal rate of  $\text{O}_2$  consumption. Pre-

vious reports that the rate of removal of (I) is a logarithmic function of time are confirmed. The rate increases approx.  $\propto$  the metabolic rate to a crit. level of activity, sp. for each subject. R. N. C.

**Metabolism of lactic and pyruvic acids in normal and tumour tissues. V. Synthesis of carbohydrate.** M. P. BENOY and K. A. C. ELLIOTT (Biochem. J., 1937, 31, 1268—1275).—Synthesis of carbohydrate by slices of rat liver was observed with 0.04M-*dl*-lactate and with 0.02M-pyruvate as substrates. Kidney cortex synthesised carbohydrate from lactate, pyruvate, succinate, fumarate, malate, and alanine. A 4- to 5-fold increase in concn. of the substrate suppressed synthesis. Brain, testis, and tumour tissue showed no synthesis from lactate or pyruvate. J. L. C.

**Pyruvate oxidation in brain. III. Nature, specificity, and course of oxidation catalysed by vitamin-B<sub>1</sub>.** G. K. MCGOWAN and R. A. PETERS (Biochem. J., 1937, 31, 1637—1641).—The "pyruvate oxidase" system in pigeon's brain containing vitamin-B<sub>1</sub> does not utilise succinic,  $\alpha$ -keto-glutaric or  $\alpha$ -adipic acid, or CH<sub>3</sub>Ac-CO<sub>2</sub>H as substrate nor do these acids increase the rate of oxidation of AcCO<sub>2</sub>H. Hence the system is not a general  $\alpha$ -keto-oxidase and appears to be sp. for pyruvate. F. O. H.

**Digitalis in body-fluids of digitalised patients.** M. A. SCHNITKER and S. A. LEVINE (Arch. Int. Med., 1937, 60, 240—250).—Digitalis was demonstrated in the oedema fluid in amounts sufficient to cause clinical symptoms. H. G. R.

**Reabsorption of glucose from the renal tubule in amphibia and the action of phloridzin on it.** A. M. WALKER and C. L. HUDSON (Amer. J. Physiol., 1937, 118, 130—143).—Glucose (I) is reabsorbed in the proximal convoluted tubule of *Necturus* and the frog, but not in the distal convoluted tubule. The degree of reabsorption is reduced by increased rate of flow through the tubule, or by high plasma-(I). Reabsorption is unaffected by increase of [NaCl] in the tubule fluid to vals. that double the osmotic pressure of the tubule fluid. Phloridzin (II) prevents reabsorption of (I) in the tubule, but H<sub>2</sub>O reabsorption continues. (I) passes into the blood if the concn. in the tubule fluid becomes considerably > plasma-(I). (II) does not appear to interfere with esterification of (I) by kidney phosphatase, nor does CH<sub>2</sub>I-CO<sub>2</sub>H selectively diminish (I) reabsorption; these results do not support Lundsgaard's hypothesis (see A., 1933, 1076). R. N. C.

**Site of acidification of the urine within the renal tubule in amphibia.** H. MONTGOMERY and J. A. PIERCE (Amer. J. Physiol., 1937, 118, 144—152).—Acidification takes place in the distal convoluted tubule in *Necturus*, the cells responsible being situated near the distal end of this segment. The functions of the cells are not affected by increase of blood-*p<sub>H</sub>* with NaHCO<sub>3</sub>. R. N. C.

**Rôle of the tubule in the excretion of urea by the amphibian kidney: ultramicro-determination of urea-nitrogen.** A. M. WALKER and C. L. HUDSON (Amer. J. Physiol., 1937, 118, 153—166).—Concn. of urea occurs in the distal convoluted tubule

of *Necturus*, the proximal tubule being permeable to urea in either direction. The frog kidney concentrates urea to an extent varying with the plasma-urea concn., the concn. occurring largely in the distal tubule. Improvements are described in the technique of the ultramicro-determination of urea-N.

R. N. C.

**Role of the tubule in the excretion of inorganic phosphates by the amphibian kidney.** A. M. WALKER and C. L. HUDSON (Amer. J. Physiol., 1937, 118, 167—173).—Concn. of PO<sub>4</sub>''' occurs progressively throughout the whole length of the tubule of *Necturus* and the frog, the process being slightly augmented in the distal tubule. The proximal tubule of *Necturus* is permeable to PO<sub>4</sub>''' in either direction. The proximal tubules of both species are capable of reabsorbing PO<sub>4</sub>'''.

R. N. C.

**Total molecular concentration and chloride concentration of fluid from different segments of the renal tubule of amphibia: site of chloride reabsorption.** A. M. WALKER, C. L. HUDSON, T. FINDLEY, jun., and A. N. RICHARDS (Amer. J. Physiol., 1937, 118, 121—129).—Total mol. concn. and [Cl] in the fluid in the renal tubules of the frog and *Necturus* show little change from those of plasma until the fluid reaches the distal convoluted tubule, where they show marked decreases through reabsorption.

R. N. C.

**Rate of excretion of cobalt by sheep after drenching with cobalt chloride.** H. O. ASKEW and S. W. JOSLAND (New Zealand J. Sci. Tech., 1937, 18, 888—892).—Rams drenched with 4 mg. of Co as CoCl<sub>2</sub> excreted most of the Co in the urine and faeces in the first 48 hr., and the whole in 5 days.

L. D. G.

**Subacute magnesium deficiency in rats. E.** WATCHORN and R. A. McCANCE (Biochem. J., 1937, 31, 1379—1390).—Rats on a diet containing 40 p.p.m. of Mg but otherwise adequate exhibit symptoms of disease after approx. 10 days but become apparently healthy after a further 7—10 days; at the end of 3 months disease again appears. Mg deficiency results in calcification of the kidneys, brittleness of the bones, whiteness or translucency of the teeth, approx. 50% decrease in the Mg content of the blood and teeth, approx. 33% decrease in that of the bones, increase in the H<sub>2</sub>O content of bones, teeth, and kidneys, and decrease in the P content of the teeth. The Mg content of the soft tissues and the phosphatase contents of the blood, bones, and kidneys are not affected. W. McC.

**Hexocystine and hexomethionine.**—See A., II, 403.

**Structure in relation to living biological functions.** J. H. SCHULMAN (Trans. Faraday Soc., 1937, 33, 1116—1125).—When a suitable polar compound is injected into the substrate of a unimol. film of a second polar compound, the injected compound can enter the film to form a very strong mixed film with modified surface potential. This is attributed to dipole interaction between the mols. and can occur with a compound too sol. to form a film alone. The gel-like structure of protein spread in a

unimol. film is attributed to intermol. dipole association. A mixed film of gliadin and cholesterol appears to form a double-layer film on compression, the OH dipole of the cholesterol anchoring a polar group of the protein unit. At lower pressure, a gel-like mixed film is formed. Protein films can also adsorb mols. from the substrate, the surface pressure of the film remaining const. but the surface potential changing. The results are applied to explain the mechanism of hæmolysis and agglutination. J. W. S.

**Animal membranes.** A. KROGH (Trans. Faraday Soc., 1937, 33, 912—919).—Animal membranes are classified into surface membranes of cells, exudation membranes, membranes built up of cells or syncytia, and membranes of complex structure. Examples are discussed with reference to this classification. J. W. S.

**Apparent permeability of the capillary membrane in man.** A. KEYS (Trans. Faraday Soc., 1937, 33, 930—939).—The blood vascular capillary membranes are permeable to  $H_2O$  and salts, but, after displacement, the osmotic balance is readjusted mainly by shift of  $H_2O$  and only secondarily by shift of salts. The order of rates of diffusion across the membrane is  $H_2O > \text{urea} > K^+, Na^+, Cl^-, NO_3^- > Ca^{++}, Mg^{++}, PO_4^{--} > \text{glucose}, SO_4^{--}, SCN^- > \text{sucrose}$ . The membrane behaves like a collodion membrane with pores of radius generally  $< 2 \times 10^{-7}$  cm., but with occasional larger holes. J. W. S.

**Methods of measuring surface forces of living cells.** E. N. HARVEY (Trans. Faraday Soc., 1937, 33, 943—946).—The centrifuge, compression, kinetic, and sessile drop methods of determining the surface forces of naked cells are described, and the results compared. The methods show that the surface has elastic properties and that the sum of the surface and elastic tensions is low (0.1—3 dynes per cm.). J. W. S.

**Electric impedance of marine egg membranes.** K. S. COLE (Trans. Faraday Soc., 1937, 33, 966—972).—Impedance measurements over the frequency range 1—16,000 kc. indicate that the membrane resistance of unfertilised and fertilised *Hippoonoe* eggs is  $> 25$  ohms per sq. cm. The plasma membrane capacities of unfertilised and fertilised eggs are: *Hippoonoe* 0.87, *Asterias* 1.1, and *Arbacia* 0.73  $\mu F.$  per sq. cm., respectively. The membrane capacity of *Hippoonoe* eggs is decreased by swelling in dil. sea- $H_2O$ . The fertilisation membrane capacities are: *Hippoonoe* 2.0 and *Arbacia* 3.1  $\mu F.$  per sq. cm. At frequencies  $> 1000$  kc., an unidentified structure becomes important, the effect being a max. at about 16,000 kc. J. W. S.

**Properties of the gill membranes of fishes.** A. KEYS (Trans. Faraday Soc., 1937, 33, 972—981).—The osmotic pressures of the blood of fishes and of their environment indicate that gill membranes are relatively impermeable to  $H_2O$  and salts, but that, excepting in euryhaline fishes, this impermeability is destroyed when the normal osmotic gradient across the membrane is reversed. The membranes permit free passage of  $CO_2$ ,  $O_2$ , and  $NH_3$  and, excepting in elasmobranchs, are relatively permeable to urea. The membrane allows small amounts of  $H_2O$  and minute

amounts of  $Na^+$  and  $Cl^-$  to pass, but is absolutely impermeable to  $IO_3^-$ ,  $Fe(CN)_6^{--}$ ,  $SO_4^{--}$ ,  $Ca^{++}$ , and glucose. The secretory work by the gills of marine teleosts may be due to an oxidative mechanism.

J. W. S.

**Resting potentials of muscle and nerve, and depolarisation by various agencies.** S. L. COWAN (Trans. Faraday Soc., 1937, 33, 1023—1028).—Experimental data on resting potentials are summarised. It is suggested that the potential is due to increased permeability of the injured membrane by, e.g., removal of certain cations normally present on its outer surface. The discharge of the injury potential will permit extension of the change in permeability at the injured point and add to the cations at the anode (uninjured point). J. W. S.

**Physico-chemical basis of electrotonus.** H. ROSENBERG (Trans. Faraday Soc., 1937, 33, 1028—1035).—Core-conductor models which reproduce the electrotonus observed in nerves are discussed. Experimental results support the assumption that the cathodic potential which is manifested as electrotonus is the intrinsic stimulus for the nerve membrane in physiological activity. J. W. S.

**Physical and chemical properties of nerve fibres and the nature of synaptic contacts.** J. Z. YOUNG (Trans. Faraday Soc., 1937, 33, 1035—1040).—The physical structure of nerve fibres and the function of the various layers in nerve conduction are discussed. J. W. S.

**Bio-electrical properties of frog skin.** R. B. DEAN and O. GATTY (Trans. Faraday Soc., 1937, 33, 1040—1046).—Existing knowledge of the bio-electrical behaviour of frog's skin is summarised. J. W. S.

**Skin potentials in human subjects.** W. F. FLOYD and C. A. KEELE (Trans. Faraday Soc., 1937, 33, 1046—1049).—The palmar surfaces of the hands and fingers and plantar and dorsal surfaces of the feet ("active regions") show typical variations of potential relative to the other ("inactive") regions of the skin after suitable stimulation, e.g., by noise, electric shock, or a deep breath. The potential cannot be correlated with skin temp. and is independent of area of contact. J. W. S.

**Factors in membrane permeability.**—See A., I, 512.

**Activation energy of diffusion through natural and artificial membranes.**—See A., I, 513.

**Effect of the pancreas on the serum-phosphatase of dogs.** S. FREEMAN and A. C. IVY (Amer. J. Physiol., 1937, 118, 541—548).—Serum-phosphatase (I) is only slightly affected by atrophy of the pancreas, but pancreatectomy causes a rise followed by a fall. The increase is  $<$  that following occlusion of the common bile duct, which effect is unaltered by pancreatectomy. Sucrose in the pre-operative diet augments the effect of pancreatectomy on (I), but raw pancreas has no significant effect. R. N. C.

**Mobilisation and formation of glycogen and fats in enervated muscle.** F. CEDRANGOLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 185—186).—

Section of the sciatic nerve is followed by increases in the glycogen (I) content in dogs and frogs. In dogs, fasting produces a total lack of fat mobilisation in the muscle and, during a period of nutrition, a formation of (I) and fat equal to that of the control innervated muscle.

F. O. H.

**Chemical and histological changes in denervated skeletal muscle of the monkey and cat.** H. CHOR, R. E. DOLKART, and H. A. DAVENPORT (Amer. J. Physiol., 1937, 118, 580—587).—The  $H_2O$  content of the denervated muscle is unaltered, although its extractability by  $COMe_2$  is facilitated in the later stages of atrophy. Total N and lipin are unaffected, but total P falls within a week of denervation.

R. N. C.

**Significance of the adrenals for adaptation.** H. SELYE (Science, 1937, 85, 247—248).—Evidence for the view that the function of the adrenals is to increase the resistance of the organism to stimuli that produce an alarm reaction is summarised. Rats previously adapted to certain stimuli tolerate exposure to these stimuli even after adrenalectomy. The adrenals are concerned in the first stage of adaptation, but further adaptation is governed by changes in the peripheral tissues; the stimulus ceases to be an alarm and adrenal hormones are no longer required. The symptoms of an alarm reaction are assumed to be due mainly to the liberation from the tissues of a toxic metabolite, possibly histamine. Loss of Na or increase of K or of non-protein-N are also symptoms rather than the cause of adrenal insufficiency.

L. S. T.

**Significance of the adrenals for adaptation to mineral metabolism.** E. C. KENDALL and D. J. INGLE (Science, 1937, 86, 18—19).—In adrenalectomised dogs, maintained without cortin on a diet containing much NaCl and Na citrate, addition of gradually increasing amounts of K<sup>+</sup> or sudden variations in the NaCl content in the diet results in an acquired tolerance by the animal. During stimulation of muscles in adrenalectomised rats blood-serum-K increases, and as failure approaches the [K<sup>+</sup>] rises to 30—40 mg. per 100 c.c. The increase in K is more sudden in presence of thyroxine. The primary change is probably inability to resist sudden changes in the concn. or distribution of electrolytes (cf. preceding abstract). K should be included as one of the toxic metabolites postulated by Selye.

L. S. T.

**Mechanism of stimulation of carotid gland chemoreceptors.** C. V. WINDER (Amer. J. Physiol., 1937, 118, 389—398).

R. N. C.

**Present position of radiation-genetics.** H. STUBBE (Naturwiss., 1937, 25, 483—490, 500—506).—A general review of recent work on the effect of various types of radiation in producing mutations.

W. O. K.

**Origin of bio-electric phenomena.** K. H. MEYER (Trans. Faraday Soc., 1937, 33, 1049—1051).—Action currents may arise through a chemical change in a membrane or variation in the  $p_H$  of the surrounding medium, and probably only secondarily through the consequent change in the ionic permeability of the membranes.

J. W. S.

**Radiations, cell permeability, and colloidal changes.** S. TCHAKHOTINE (Trans. Faraday Soc., 1937, 33, 1068—1072).—The author's investigations by the micro-ray puncture method are described briefly. Radiations of suitable  $\lambda$  increase the permeability of the surface layer of the cell, owing to disaggregation of the cell membrane, and also change the colloidal state of the proteins and other complex substances in the cytoplasm. The effects are generally obtained with 2800 Å. radiation, but not with 2930 or 3100 Å. unless the object is photosensitised, e.g., with eosin.

J. W. S.

**Effect of  $\alpha$ -rays on surviving tissue.** B. RAJEWSKY and K. INOUE (Naturwiss., 1937, 25, 540—541).—Tumour tissue was submitted to the action of  $\alpha$ -rays in Ringer's solution containing Ra emanation. Layers of tissue, of thickness about twice the range of  $\alpha$ -particles in the tissue, were used. The anaerobic glycolysis of the tissue was examined at 6° and 37°. There is a definite connexion between the no. of  $\alpha$ -particles and the decrease in glycolysis.

A. J. M.

**Effect of ultra-violet and X-rays on the oxidation-reduction potentials of frog's muscle *in vivo*.** Y. UCHIMURA (J. Biochem. Japan, 1937, 25, 207—217).— $E_h$  (normally + 230 mv.) is increased by ultra-violet or X-irradiation, the latent period being greater with X-rays. The increase occurs only when both dehydrogenase and H donator are present. Increase of reduced glutathione occurs with limited irradiation.

F. O. H.

**Existence of products of histolysis caused by absorption of tissues damaged by X-rays in rabbits.** J. LOISELEUR and C. CROVISIER (Compt. rend. Soc. Biol., 1937, 125, 923—925).—Products of histolysis, adsorbed on the proteins of the blood-plasma, can be demonstrated after irradiation of the thymus.

H. G. R.

**Histochemistry of the neutral fats and lipins of the irradiated skin of normal, hypernephrectomised, and fasting animals.** B. JALOWY and S. MALCZYNSKI (Compt. rend. Soc. Biol., 1937, 125, 1090—1092).—Active secretion of the sebaceous glands occurs, covering the epidermis with a thick layer of fatty substances.

H. G. R.

**Effects of X-rays on frog skin.** A. E. LIGHT (Radiol., 1935, 25, 734—738).—Dilation of capillaries, X-ray shock, and increased N elimination following irradiation result from the release and diffusion of "H" substance from injured cells. The effect is due directly to X-rays or to secondary cathode rays produced by the primary beam impinging on the tissue.

CH. ABS. (p)

**Radiation of heat from the human body.** V. TRANSMISSION OF infra-red radiation through skin. J. D. HARDY and C. MUSCHENHEIM (J. Clin. Invest., 1936, 15, 1—9).—Approx. 95% of infra-red rays are absorbed within 2 mm. of the surface. Therapeutic effects are confined to the surface.

CH. ABS. (p)

**Development of eye colours in *Drosophila*. Relationship between pigmentation and release**

of diffusible substances. B. EPHRUSSI and S. CHEVAIS (Proc. Nat. Acad. Sci., 1937, 23, 428—434).  
E. M. W.

Effect of changes in  $p_H$  on the action of mammalian A nerve fibres. J. E. LEHMANN (Amer. J. Physiol., 1937, 118, 600—612).  
R. N. C.

Effect of changes in the potassium-calcium balance on the action of mammalian A nerve fibres. J. E. LEHMANN (Amer. J. Physiol., 1937, 118, 613—619).—Exclusion of  $Ca^{++}$  from the solution or its de-ionisation with citrate affect the nerve in a similar manner to increase of  $p_H$ , whilst exclusion of  $K^+$  affects it similarly to lowering of  $p_H$ .  
R. N. C.

Influence of mineral electrolytes in the biochemical synthesis of polyholosides. G. MALFATTANO and M. CATOIRE (Ann. Ferm., 1937, 3, 52—55).—A crit. review.

Prolongation of action of the pituitary antidiuretic substance, and of histamine, by metallic salts. E. C. DODDS, R. L. NOBLE, H. RINDERKNECHT, and P. C. WILLIAMS (Lancet, 1937, 233, 309—311).—With rats, the addition of aq.  $Zn(OAc)_2$  prolongs the antidiuretic activity of a posterior pituitary extract.  $Cd^{++}$  and  $Ni^{++}$  have an action similar to but  $>$  that of  $Zn^{++}$ . The effects of other metallic salts are recorded. The presence of  $Zn(OAc)_2$  prolongs the action of histamine acid phosphate or hydrochloride in stimulating gastric secretion in cats.  
L. S. T.

Traumatic shock and mineral constituents of the blood. G. STOLFI and A. LALLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 161—162).—Traumatic shock in rabbits decreases the  $Na^+$  and  $Ca^{++}$  and increases  $Cl^-$  (especially plasma- $Cl^-$ ) content of the blood.  
F. O. H.

Reaction of amphibian skeletal muscle to calcium ion and ionisation of calcium citrate. I. CHAO (Chinese J. Physiol., 1937, 12, 101—107).—In aq. Ca citrate the response of the toad sartorius to const. electrical stimulation depends on  $[Ca^{++}]$  and not on total Ca, and it can be used for determination of  $[Ca^{++}]$ . The results obtained support the hypothesis of Hastings *et al.* (A., 1934, 1307) that ionisation of Ca citrate takes place in two stages.  
J. N. A.

Comparative effect on the blood-sugar of the rabbit of sodium fluoride, chloride, bromide, and iodide. R. HAZARD, C. VAILLE, and Y. CAGNAUX (J. Pharm. Chim., 1937, [viii], 26, 101—105).—Intravenous injection of 5.0% aq.  $NaCl$ ,  $NaBr$ , or  $NaI$  (in doses of 0.1—1.0 g. per kg. body-wt.) into rabbits produces an irregular hyperglycæmia lasting several hr. 1.0%  $NaF$  in doses of 0.02—0.05 g. has a more marked hyperglycæmic action.  
W. O. K.

Effect of air-borne iodine from Brittany on the iodine supply in central Europe. H. CAUER (Biochem. Z., 1937, 292, 116—140).—Part of the I escaping into the atm. in Brittany during I production from seaweed probably reaches Germany and other central European countries in amounts sufficient to have significant biological consequences. In 1933 and 1934, approx. 13,000 kg. of I escaped thus from the Breton kelp-burning localities.  
W. McC.

Effect of mono-, di-, and tri-calcium phosphates on reproductive success in rats. W. M. COX, jun., and M. IMBODEN (J. Nutrition, 1936, 12, 509—514).—When fed at high Ca levels (2.45%)  $Ca(H_2PO_4)_2$  was unsuitable for reproductive purposes.  $Ca_3(PO_4)_2$  was superior to  $CaHPO_4$  but the difference would probably not be apparent at lower levels of feeding.  
A. G. P.

Effect of feeding excess of cobalt to healthy sheep. S. W. JOSLAND (New Zealand J. Sci. Tech., 1937, 19, 31—37).—Feeding 5 mg. of Co as  $CoSO_4$  per kg. body-wt. to sheep caused polycythæmia in one and mild anæmia in two cases. Daily feeding of 5 mg. of Co caused two cases to become anæmic in 10 months. Co is not toxic and a small storage in the organs occurs.  
W. L. D.

Erythrocyte reaction of the dog to cobalt. G. BREWER (Amer. J. Physiol., 1937, 118, 207—210).  
R. N. C.

Pharmacological application of furfuraldehyde.—See A., II, 428.

Action of certain substituted phenols on marine eggs in relation to their dissociation. A. TYLER and N. H. HOROWITZ (Proc. Nat. Acad. Sci., 1937, 23, 369—374).—The action of various nitro- and chloro-phenols on sea urchin eggs  $\propto$  the concn. of undissociated mols. in the solution applied, i.e., the compounds penetrate the cell in the undissociated form. Within the cell the mols. dissociate and their action in stimulating respiration and in causing reversible blocking of cleavage is controlled by the concn. of the dissociated form.  
A. G. P.

Physiological action of  $[\beta\text{-}3\text{:}4\text{-}]\text{dihydroxyphenylethylamine}$  and sympathol. M. R. GURD (Quart. J. Pharm. 1937, 10, 188—211).—In their physiological action, the two drugs are intermediate between adrenaline (I) on the one hand, and tyramine and ephedrine on the other. The results indicate that the presence of the 3:4-(OH) $_2$ -groups is of more importance in producing a (I)-like action than is the structure of the side-chain.  
J. N. A.

Friedel-Crafts reaction. I. Synthesis of new pharmaceutical [heterocyclic] compounds.—See A., II, 432.

Is castor oil the cause of alimentary disequilibrium as the result of its purgative action bringing about a partial or total inhibition of resorption? R. LECOQ (Bull. Sci. Pharmacol., 1937, 44, 156—163).—The replacement, in the diet, of castor oil by a corresponding quantity of ricinoleic acid, which has a more intense purgative action, results in greater disequilibrium. In pigeons on a diet rich in castor oil, the resorption of lipins was  $>$  85%. It is unlikely that the disequilibrium is due directly to inhibition of resorption.  
W. O. K.

Effect of intravenous injection of glycogen on the quantity of glycogen in the organs. J. PELCZARSKA (Compt. rend. Soc. Biol., 1937, 125, 1079—1081).—Glycogen (I) is decreased in the liver and increased in the lung of rabbits by a single injection. When injected over a period of 2 days,

there is an increase in lung-(I) but no change in liver-(I) in dogs. H. G. R.

**Lecithin and liver-glycogen, blood-sugar, and glycosuria in normal and thyroidectomised animals.** VI. F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1937, 12, 123—125; cf. this vol., 265).—Injection of aq. emulsions of lecithin into fasting (12 hr.) rabbits diminishes glycosuria and hyperglycaemia due to injection of glucose, whilst with a 36 hr. fast the glycosuria and hyperglycaemia are increased; in all animals, storage of liver-glycogen is diminished. The phenomena do not occur after thyroidectomy. F. O. H.

**Effect of parenterally administered peptone.** G. MILLES and L. SEED (Arch. Int. Med., 1937, 60, 251—263).—Diuresis and a decrease in the spinal fluid- and blood-pressure were observed in dogs. H. G. R.

**Effect of eserine on the stability of the complex present in the brain liberating acetylcholine on heating.** E. CORTEGGIANI (Compt. rend. Soc. Biol., 1937, 125, 944—945).—The complex is unstable in the absence of eserine or NaCl. H. G. R.

**Reconstitution *in vitro* of the complex liberating acetylcholine in the brain.** E. CORTEGGIANI, A. CARAYON-GENTIL, J. GAUTRELET, and A. KASWIN (Compt. rend. Soc. Biol., 1937, 125, 945—947).—The complex can be re-formed by adding acetylcholine to brain tissue. H. G. R.

**Presence of a complex liberating acetylcholine on heating in various organs of vertebrates.** E. CORTEGGIANI (Compt. rend. Soc. Biol., 1937, 125, 949—951). H. G. R.

**Action of acetylcholine on isolated muscle.** A. MARNAY (Compt. rend. Soc. Biol., 1937, 125, 1007—1009).—No change occurs in the adenylypyrophosphoric acid or hexose mono- or di-phosphate whilst phosphagen is decreased after anaerobiosis in presence of eserine. H. G. R.

**Action of acetylcholine on minced muscle.** A. MARNAY (Compt. rend. Soc. Biol., 1937, 125, 1009—1011).—Acetylcholine increases glycolysis in minced as in isolated muscle (A., 1936, 757). H. G. R.

**Pharmacodynamics of the anterior dorsal muscle of the leech; biological reagent for acetylcholine.** P. DODEL and G. DASTUGUE (Bull. Sci. Pharmacol., 1937, 44, 145—155).—The effect of various agents and conditions on the behaviour of the muscle is reported, with special reference to the action of acetylcholine. W. O. K.

**Trophophylaxis, a new property of foods.** P. LASSABLIÈRE (Compt. rend., 1937, 204, 1893—1894).—Many substances, including proteins, carbohydrates, fats, and inorg. salts, when administered orally or subcutaneously, protect mice against a lethal dose of cobra venom. Animals suffering from inanition are 2—10 times as sensitive to the venom as controls. These "trophophylactins" are stable at 100°. J. L. D.

**"Caseinic acid" in tissue culture.** V. TROITZKI (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 36—40).—Casein had no ill-effects on

cultures in "natural solvent" or blood plasma, and small proportions of Na caseinate-HCl stimulated growth on plasma substrates. CH. ABS. (p)

**Protective action of certain purines against liver necrosis produced by carbon tetrachloride and chloroform.** R. C. NEALE (Science, 1937, 86, 83—84).—The cryst. substance from hog liver (this vol., 295) which protects rats from liver necrosis in CCl<sub>4</sub> poisoning is a purine, probably Na xanthine (I). Na guanine and (I) have the same protective action as the liver prep., and also protect the livers of rats in CHCl<sub>3</sub> poisoning. L. S. T.

**Combined effect of local anaesthetics.** I. A. RABBENO. II. Percaine-cocaine and percaine-tutocaine. F. CAVALLI and A. PATANIA (Boll. Soc. ital. Biol. sperim., 1937, 12, 125—127, 127—130).—I. Methods of investigation are discussed.

II. Mixtures of anaesthetics of the same type [e.g., percaine (I) and tutocaine] exhibit phenomena of summation, synergism, and antagonism whilst those of different types [e.g., (I)-cocaine] exhibit only summation and synergism. F. O. H.

**Effect of temperature on the production of anaesthesia by propyl bromide and the anaesthetic content of the brain of the gudgeon maintained at 12—25°.** M. TIEFFENEAU and D. BROUN (Compt. rend. Soc. Biol., 1937, 125, 989—991).—The time for production of anaesthesia at 15° is twice that at 25°, the concn. of PrBr present in the brain being the same at the onset of anaesthesia. H. G. R.

**Effect of decreased temperature on production of anaesthesia by propyl bromide and the anaesthetic content of guinea-pig's brain.** M. TIEFFENEAU and H. BARCLAY (Compt. rend. Soc. Biol., 1937, 125, 991—993).—At decreased temp. the rate of production of anaesthesia is increased and the concn. of PrBr in the brain is lower at the onset of anaesthesia. H. G. R.

**Theory of narcosis.** K. H. MEYER (Trans. Faraday Soc., 1937, 33, 1062—1064; cf. A., 1935, 893; 1936, 240).—Experimental evidence indicates that narcosis begins when any chemically indifferent substance reaches a certain molar concn. in the lipid alcohols of the cell substance. This concn. depends on the nature of the animal or cell but is independent of the narcotic. J. W. S.

**Action of narcotics on enzymes and cells.** A. J. CLARK (Trans. Faraday Soc., 1937, 33, 1057—1061).—Published data on the action of narcotics on cells are summarised. They can be most easily explained by the hypothesis that the narcotics are absorbed on the surfaces of the cells, but most can also be interpreted by the alternative theory that the drugs dissolve in and alter the cell-lipins. The inhibition of the action of certain purified enzymes by narcotics suggests that they act in a similar manner *in vitro* and *in vivo*. J. W. S.

**Hypnotic effects of *as*-arylalkylcarbamides.**—See A., II, 404.

**Anaesthetic action of alkaloids of *Erythrophlaeum*.** E. TRABUCCHI (Arch. Farm. sperim.,

1937, 64, 97—129, and Boll. Soc. ital. Biol. sperim., 1937, 12, 234—237; cf. this vol., 179).—Compared with percaïne (I) for their anæsthetic action on mucosa, the alkaloids (II) give the series madagascar > omofeine > erythrofeine > (I) > cassaine > norcassaidine. The anæsthetic action of (II) is slow in manifestation but of long duration. F. O. H.

**Eserine and muscular function. I.** Total acid-soluble phosphorus in eserinated muscle. E. MARTINI, C. TORDA, and L. BELLONI. **II.** Phosphagen in eserinated muscle. E. MARTINI and C. TORDA. **III.** Heat-contraction, total acid-soluble phosphorus, and phosphagen in eserinated muscle. C. TORDA (Boll. Soc. ital. Biol. sperim., 1937, 12, 97—98, 98, 99).—I. Neither faradic stimulation nor injection of eserine increases the content of acid-sol. P (I) in frog's gastrocnemius; stimulation of the eserinated muscle, however, increases (I). **II.** The phosphagen (II) content (normally 0.059%) is increased to 0.077%.

**III.** Eserination of muscle does not affect the heat-contraction; (I) is unchanged but (II) is increased. F. O. H.

**Blood-sugar level after administration of eserine and atropine.** M. C. HRUBETZ (Amer. J. Physiol., 1937, 118, 300—301).—Eserine causes a rise in blood-sugar in the rat, which reaches a max. in 1 hr. and returns to normal in 2 hr.; atropine abolishes the effect. R. N. C.

**Influence of sympathetic and parasympathomimetic drugs on intestinal absorption of peptone and glycine.** G. COSTA (Arch. Fisiol., 1937, 37, 170—179).—With aq. peptone, absorption of the  $H_2O$  in dogs with fistulæ is increased by pilocarpine (I), atropine (II), and adrenaline and decreased by ergotamine (III) whilst that of N is decreased by (I) and (II) and increased by (III). With aq. glycine, no significant changes in absorption occur. The effect of the drugs appears to increase with increasing mol. wt. of the absorbed substance. F. O. H.

**Effect of the diffusion factor (-R) on absorption of drugs. I.** Rate of absorption of subcutaneously and intramuscularly injected strychnine. **II.** Rate of absorption of intraperitoneally injected strychnine. U. SAMMARTINO (Arch. Farm. sperim., 1937, 64, 53—74, 89—96).—Injection of testicle (ox) extract containing the diffusion factor-R (cf. Strum *et al.*, A., 1933, 302) significantly increases the rate of absorption of strychnine salts administered by the above routes. F. O. H.

**Effect of phloridzin on liver-glycogen and residual nitrogen in nephrectomised animals.** C. ARDY and G. GALLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 137—138).—Liver-glycogen (rat) is increased but the effect on residual N is not conclusive. F. O. H.

**Strychnine excitation and acetylcholine content of the central nervous system.** O. LOEWI (Naturwiss., 1937, 25, 526).—The acetylcholine content of the central nervous system of frogs kept for several hr. in convulsion by strychnine is about twice that of normal frogs. A. J. M.

**Pharmacology of pyrethrum flowers.** H. ROSEN and M. R. THOMPSON (J. Amer. Pharm. Assoc., 1937, 26, 631—642).—The flowers, in which no volatile active constituent was found, are toxic (as aq. EtOH suspensions of the extract) to warm- and (more so) to cold-blooded animals. The main physiological actions and their mechanism are discussed. Two new methods of assay, using the frog and isolated rabbit's intestine, respectively, are described and examples of assay by various methods given.

F. O. H.

**Methyl alcohol and toxic methyl compounds.** F. FLURY and W. WIRTH (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 221—226).—The high toxicity of MeOH and certain Me compounds can be explained by their oxidation in the body to  $CH_2O$ . M. A. B.

**Carbon monoxide intoxication in heavy smokers.** A. RUHL and P. LIN (Deut. med. Woch., 1936, 62, 493—497; Chem. Zentr., 1936, i, 3716—3717).—With heavy smokers who inhale, the blood-CO has a mean val. of 0.52 c.c. per 100 c.c., rising during smoking to 2 c.c.; non-inhaling smokers and moderate smokers show no such increase in blood-CO.

H. N. R.

**Increase of chromophilic substance in the adrenals in chronic carbon monoxide inhalation.** F. J. SCHMELZER (Arch. Hyg. Bakt., 1935, 115, 1—8; Chem. Zentr., 1936, i, 3707—3708).—In acute CO poisoning of guinea-pigs the chromophilic substance in the adrenals diminishes. In chronic poisoning there is probably hyperfunction of the medulla cells. In sub-acute poisoning there is a slow approach to the chronic condition. A. G. P.

**Detection of inhaled hydrocyanic acid.** (A) G. D. ELSDON and J. R. STUBBS. (B) G. R. LYNCH (Analyst, 1937, 62, 540, 540—541).—(A) The viscera of two cases of suspected HCN poisoning gave negative or inconclusive tests for HCN. 250 ml. of blood from the lungs were steam-distilled until 15 ml. of distillate collected, on which the Prussian-blue (I) and CNS' tests were carried out, with slight but definite results indicating 1 mg. of HCN per litre of blood.

(B) When the (I) and CNS' tests fail, the steam distillate is treated with  $Pb(OAc)_2$  and dil. aq.  $H_2SO_4$  in a conical flask over the mouth of which is placed a drop of aq.  $AgNO_3$  on a microscope slide. In presence of HCN,  $AgCN$  is identifiable by its characteristic cryst. appearance. Alternatively, or in addition, the alloxan test (A., 1921, ii, 359) is applied. E. C. S.

**Occurrence of "mottled enamel" of teeth in Alberta and its relation to the fluorine content of the water supply.** O. J. WALKER and E. Y. SPENCER (Canad. J. Res., 1937, 15, B, 305—314).—In areas where mild mottled enamel is endemic, deep wells show a high F content (1—4 p.p.m.). A. Li.

**Electrolyte balance during recovery from mercuric chloride poisoning.** J. H. TALBOTT, F. S. COOMBS, and W. V. CONSOLAZIO (Arch. Int. Med., 1937, 60, 301—311).—After a 6-day period of anuria the following changes were observed in the body-fluids: decrease in base,  $Cl'$ , serum-protein and

-hæmoglobin, increase in acid, and retention of  $\text{PO}_4^{'''}$  and N products. H. G. R.

**Toxicity of ammonium ions.** B. BASSANI and A. FERRANTE (Arch. Fisiol., 1937, 37, 180—189).—When short periods are allowed for recovery and no protective mechanism is afforded against exhaustion of the alkaline reserve of the blood, the lethal dose of intravenously injected  $\text{NH}_4\text{Cl}$  (as  $\text{NH}_4^+$ ) in dogs is approx. 0.15 g. per kg.; simultaneous injection of  $\text{NaHCO}_3$  greatly increases this val. With cessation of injection, recovery is rapid. Conversion of  $\text{NH}_4^+$  into urea is discussed. F. O. H.

**Influence of histolysates on enzymic processes.** A. M. UTEVSKI and N. S. LEVANTZOVA (Med. exp. Ukraine, 1934, No. 1, 23—30).—In dog blood of high total glutathione (I) content, hepatolysate (II) in high- or low-mol. fractions has little effect; in blood of low (I) content (II) causes a sharp increase in (I). CH. ABS. (p)

**Action of short radio waves on enzymes.** N. A. ROSHANSKI and E. I. SMIRNOVA (J. Physiol. U.S.S.R., 1935, 19, 692—704).—No direct chemical action of short waves (5—10 m.) on various enzymes was observed. The action of the waves on living tissue is due to overheating of capillaries and disintegration of intracellular structure. CH. ABS. (p)

**Biochemical hydrogenations. VI. New kind of enzymic hydrogenation of fumaric acid.** F. G. FISCHER and H. EYSENBACH (Annalen, 1937, 530, 99—120; cf. this vol., 219).—A fumarate-hydrogenase (I) is obtained from bottom yeast by drying, macerating with  $\text{H}_2\text{O}$  at  $37^\circ$ , and purifying approx. as for the prep. of the yellow enzyme; further purification cannot be effected by solvents, but tenfold concn. is brought about by adsorption from  $\text{H}_2\text{O}$  on  $\text{Al}_2\text{O}_3\text{-C}$ , elution with aq.  $\text{Na}_2\text{HPO}_4$ , and fractional pptn. by  $(\text{NH}_4)_2\text{SO}_4$ . This product still contains flavin-enzymes and EtOH-dehydrogenase, but no polysaccharides; its activity is unaffected by dialysis in Cellophane against  $\text{H}_2\text{O}$  and is thus independent of any dialysable co-enzyme. (I), freed from lacto-flavin phosphate by dialysis, effects reduction of Na fumarate to Na succinate by reduced Janus-red; neither the dye nor (I) alone is effective, nor does (I) affect the reduced dye. The reaction, followed colorimetrically in a special apparatus (described), has a temp. coeff. of 1.73—1.75 at  $10\text{--}30^\circ$ , but of only 1.5 at  $40^\circ$  owing to inactivation by heat, which is complete at  $50^\circ$ ; the velocity reaches a flat max. at about  $p_{\text{H}}$  6.5, decreasing rapidly at about  $p_{\text{H}} < 5.5$  and  $> 8$ , and is independent of the fumarate concn. but directly  $\propto$  the amount of (I) and dye. Other dyes can be used, but the velocity of the reaction depends on the redox potential of the dye, being negligible if this is  $-0.1$  v. and decreasing very rapidly if it is  $< -0.2$  v., which differentiates (I) sharply from succinodehydrogenase. The reaction is not hindered by addition of succinate, malonate,  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ , KCN,  $\text{CHCl}_3$ , or NaF. Malic acid dehydrogenates reduced Janus-red in the presence of crude, but not of pure, (I). Na maleate effects dehydrogenation, but at 0.1 the rate of the fumarate; muconates, itaconates, crotonates, cinnamates, and

oxaloacetates are ineffective. The possible biological significance of the reaction is discussed. R. S. C.

**Equilibria in dehydrogenase systems.** H. HELLSTROM, E. ADLER, and H. VON EULER (Svensk Kem. Tidskr., 1937, 49, 194—196).—Theoretical. M. H. M. A.

**Components of dehydrogenase systems. XIV. Glutamic acid dehydrogenase from yeast.** H. VON EULER, E. ADLER, and T. S. ERIKSEN (Z. physiol. Chem., 1937, 248, 227—241; cf. A., 1936, 1418).—Dry material obtained from maceration-juice of bottom yeast by pptn. with  $\text{COMe}_2$  contains a thermolabile apodehydrogenase (I) which acts specifically (asparagine, *l*-aspartic acid, *d*-arginine, *d*-ornithine, *l*-tyrosine, *dl*-proline, *dl*-alanine, glycine, glutathione not affected), in conjunction with codehydrogenase-II (not with cozymase) on glutamic acid with production of small amounts of  $\text{NH}_3$ , the yellow enzyme acting as H carrier between the dehydrocodehydrogenase-II produced in the first phase of the reaction and the acceptor (methylene-blue,  $\text{O}_2$ ). The (I) system, which exhibits optimal activity at  $p_{\text{H}}$  8, is not affected by KCN or  $\text{P}_2\text{O}_7^{'''}$ . W. McC.

**Relation between rate of enzymic oxidation and stereochemical structure of ascorbic acid and its analogues.** S. W. JOHNSON and S. S. ZILVA (Biochem. J., 1937, 31, 1366—1374).—*l*-Ascorbic acid, *d*-arabo-, *l*-gluco-, and *l*-galacto-ascorbic acid are directly oxidised by ascorbic acid oxidase from cucumber much more rapidly than are the corresponding enantiomerides. In the first group the oxidation proceeds at a linear rate but in the second the rate diminishes after some time. *l*-Arabo- and *d*-ascorbic acid are more rapidly oxidised than are *d*-gluco- and *d*-galacto-ascorbic acid. W. McC.

**Peroxidases. IV. Determination of peroxidase activity from e.m.f. measurements.** M. V. SITHARAMAN and S. RENGACHARI (J. Indian Chem. Soc., 1937, 14, 278—290; cf. A., 1936, 1417).—The peroxidase activity of plant saps can be determined from the amount of unaltered, added quinol, when used as substrate, the concn. of which is obtained from the e.m.f. of the quinone-quinol system under standard conditions. H. G. M.

**Extraction and purification of Ricinus peroxidase.** D. GARILLI (G. Biol. ind. agrar. aliment., 1936, 6, 1—16; Chem. Zentr., 1936, i, 3700).—*Ricinus* embryos are ground with quartz and  $\text{NaH}_2\text{PO}_4$ , retaining the expressed sap. After ripening the dialysed solution is treated with  $\text{Al}_2\text{O}_3\text{-C}$  (Willstatter and Kraut). The enzyme is adsorbed ( $p_{\text{H}}$  4.0) and may be subsequently eluted with  $\text{Na}_2\text{HPO}_4$  at  $p_{\text{H}}$  8.0. The eluate is dialysed, concn. in a vac., and treated with 5 vols. of 95% EtOH to ppt. the peroxidase. A co-enzyme is present in the non-dialysable portion. A. G. P.

**Aldehyde mutase.** M. DIXON and C. LUTWAK-MANN (Biochem. J., 1937, 31, 1347—1365; cf. this vol., 220).—Aldehyde oxidase acts on aliphatic and aromatic aldehydes but does not dismutate them; it is inactivated by KCN but not by  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  and does not require a co-enzyme. Aldehyde

mutase (I), which is a distinct enzyme or enzyme system, requires a co-enzyme (cozymase very efficient, glutathione, trigonelline, and adenylyl pyrophosphate inactive), dismutates but does not oxidise aldehydes (aliphatic only), and is inactivated by  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  but not by KCN. Alcohol dehydrogenase is not a component of the (I) system. W. McC.

**Acetylcholine-esterase activity of enervated muscle.** E. MARTINI and C. TORDA (Boll. Soc. ital. Biol. sperim., 1937, 12, 200—202).—Section of the ischiaticus nerve in rats produces, after 2 days, a decrease in the acetylcholine-esterase content of the corresponding gastrocnemius muscle, the val. after 12 days being approx. 26% of that of the control. F. O. H.

**Choline-esterase in the nerves of the lobster.** A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 1005—1007).—The concn. of the enzyme in the nerves is > that of the other tissues examined. H. G. R.

**Enzyme apparently active at low temperatures.** T. WENSE (Fermentforsch., 1937, 15, 291—301; cf. A., 1936, 1559).—Cultures and extracts of *Paramecium* hydrolyse acetylcholine more rapidly at 5° than at 37° because the histamine (I) produced by accompanying bacteria inhibits the action of the esterase responsible for the hydrolysis, much more (I) being produced at 37° than at 5°. W. McC.

**Lipase. III. Effect of ovarian follicular hormone on pancreatic lipase.** Y. IWASAKI (J. Biochem. Japan, 1937, 25, 177—179).—Folliculin significantly accelerates the synthetic, and retards the hydrolytic, action of the lipase. F. O. H.

**Polypeptidases in milk.** R. ABDERHALDEN (Fermentforsch., 1937, 15, 302—310).—Fresh, separated, and dried human milk is rich in di- (I) and polypeptidases (II) which retain their activity for months in the dried material. Glycyl-*L*-tryptophan (III) is rapidly hydrolysed by the milk even at 0°. Cow's milk usually contains little or no (I) and (II) and hydrolyses (III) only slowly if at all. W. McC.

**Preparation of aminopolypeptidase.** E. ABDERHALDEN and P. GREIF (Fermentforsch., 1937, 15, 311—313; cf. Waldschmidt-Leitz and Balls, A., 1930, 957).—Hæmatite obtained by Willstätter's method when boiled with distilled  $\text{H}_2\text{O}$  for several days yields a stable material which specifically adsorbs dipeptidase (I). By this means aminopolypeptidase (II) free from (I) is obtained from intestinal mucous membrane. (II) hydrolyses *DL*-leucylglycylglycine much more rapidly than *L*-leucylglycyl-*L*-leucine (III). *L*-Leucylglycyl-*D*-leucine is more slowly hydrolysed by (II) than is (III). *L*-Leucylglycyl-*L*-tyrosine and glycylglycyl-*DL*-leucine are hydrolysed by (II). W. McC.

**Polypeptidases of blood-plasma.** E. ABDERHALDEN and H. HANSON (Fermentforsch., 1937, 15, 382—395; cf. Bergmann and Fruton, this vol., 97).—The polypeptidases of the serum and plasma of rabbits hydrolyse prolylpeptides [e.g., *L*-prolylglycine, glycyl-*L*-proline, m.p. 204°, non-hygroscopic (cf. Bergmann *et al.*, A., 1933, 94)]. The hydrolysis is restricted by HCN, which affects *D*-, *L*-, and *DL*-

peptides to different extents. The action of the dipeptidases is more readily inhibited by HCN than is that of the aminopolypeptidases. W. McC.

**Action of gastric juice, pepsin-hydrochloric acid, trypsin-kinase, pancreatic juice, and pancreatin on proteins.** E. ABDERHALDEN (Fermentforsch., 1937, 15, 314—320).—No  $\text{NH}_2$ -acids (or traces only) are produced by the action of these enzymic preps. on proteins. W. McC.

**Effect of gastric juice on diketopiperazines.** E. ABDERHALDEN and F. LEINERT (Fermentforsch., 1937, 15, 324—332; cf. Shibata, A., 1934, 1260).—Histidine anhydride is hydrolysed by gastric juice and by very dil. acid. Pepsin has no effect on the rate of hydrolysis. W. McC.

**Action of pepsin-hydrochloric acid, gastric juice, trypsin, and erepsin, and of the zones of hydrogen-ion concentration within which these enzymes act, on pyrrolidonecarboxylic acid and its amide.** R. ABDERHALDEN (Fermentforsch., 1937, 15, 352—359).—The extent of hydrolysis of the acid and amide with production of glutamic acid and amide, respectively, is the same with pepsin, trypsin, and erepsin as with the respective amounts of HCl required to produce the  $[\text{H}^+]$  at which the hydrolyses occur in presence of the enzymes. The hydrolyses are therefore not of an enzymic nature. W. McC.

**Stability of defence proteinases of dried serum.** E. ABDERHALDEN (Fermentforsch., 1937, 15, 321—323; cf. A., 1928, 1283).—The defence proteinases of dried serum and cerebrospinal fluid retain their activity and specificity for >9 years. W. McC.

**Detection of defence proteinases in urine.** E. ABDERHALDEN (Fermentforsch., 1937, 15, 348—351; cf. A., 1936, 626).—Improvements in the method are described. W. McC.

**Role of specificity in the enzymic synthesis of proteins. Syntheses with intracellular enzymes.** M. BERGMANN and H. FRAENKEL-CONRAT (J. Biol. Chem., 1937, 119, 707—720).—Anilides of acylated  $\text{NH}_2$ -acids were synthesised with a prep. (I) of papain I activated by cysteine. (I) afforded the anilides of carbobenzyloxyglycine (II), m.p. 144°, benzoyl-*L*-leucine (III), m.p. 213°,  $[\alpha]_D^{25} + 9.0^\circ$  in AcOH, benzoyl-*L*-phenylalanine, m.p. 219—220°,  $[\alpha]_D^{25} + 27.6^\circ$  in  $\text{C}_5\text{H}_5\text{N}$ , and benzoyl-*L*-alanine, m.p. 175—176°,  $[\alpha]_D^{25} - 8.0^\circ$  in AcOH.  $\text{NHPh}\cdot\text{NH}_2$  in presence of (I) does not inhibit the enzyme but participates in the reaction, yielding, e.g., the phenylhydrazides of (II), m.p. 144°, and acetyl-*L*-phenylalanine, m.p. 205°,  $[\alpha]_D^{25} - 33.5^\circ$  in  $\text{C}_5\text{H}_5\text{N}$ . Negative results were obtained with benzoyl-sarcosine and with free  $\text{NH}_2$ -acids. The substrate of papain I appears to be  $\text{R}\cdot\text{CO}\cdot\text{NH}\cdot\text{CHR}'\cdot\text{CO}_2\text{H}$ , and the *L*-form only was acted on by the enzyme. Bromelin and cathepsin were both capable of forming the anilides of (II) and (III). J. L. C.

**Chemical nature of papain.** S. MAEDA (Bull. Chem. Soc. Japan, 1937, 12, 319—325).—Dialysis of an aq. solution of papain (I) greatly reduces its activity, which is subsequently increased by treatment with HCN. Pptn. with MeOH gives a gelatin-like mass which contains 3.43% of tryptophan. HCN or

PhCHO does not reactivate (I) after inactivation by  $N_2H_4$ ,  $NHPh \cdot NH_2$ ,  $NH_2OH$ ,  $NaHSO_3$ , and dimethylbarbituric acid. Hence (I)-peptidase and (I)-protease contain a  $\cdot CHO$ . Pptd. (I) is only slowly attacked by proteolytic enzymes. Trypsin and pepsin slightly increase  $CO_2H$ , but the activity of the enzyme is unaltered. J. N. A.

**Enzymic hydrolysis of glutathione by rat's kidney.** E. F. SCHROEDER and G. E. WOODWARD (J. Biol. Chem., 1937, 120, 209—217).—Reduced and oxidised glutathione (I) are completely hydrolysed into their constituent  $NH_2$ -acids by the enzyme(s) in rat's kidney. Cysteine (as sulphate) and cystine were isolated in yields of 53 and 72%, respectively. Reduced (I) titrates abnormally high by the  $NMe_4 \cdot OH$  method of Linderstrom-Lang *et al.* (A., 1935, 784). J. N. A.

**Glucosulphatase. XIII. Contents of glucosulphatase and phosphatase in various invertebrates.** T. SODA and S. Koyama (J. Chem. Soc. Japan, 1935, 56, 1338—1339; cf. A., 1936, 378).—High glucosulphatase (I) contents are recorded in sea-ear, horned top, and scallop. In many cases the (I) and phosphate contents were inversely related. The activity of (I) was high at  $pH$  4.3 in one variety and at  $pH$  9.3 in another; it was unrelated to the dry wt. of the organism. CH. ABS. (p)

**Resistance of diketopiperazinepropionic acid to fission by proteinases.**—See A., II, 390.

**Amylase activity of adipose tissue.** F. CEDRAN-GOLO (Atti R. Accad. Lincei, 1937, [vi], 25, 137—139).—See this vol., 269. F. O. H.

**Amylase in cow's milk.** G. A. RICHARDSON and C. L. HANKINSON (J. Dairy Sci., 1936, 19, 761—772).—Milk shows starch-liquefying, -dextrinising, and -saccharifying activity and is thus assumed to contain  $\alpha$ - and  $\beta$ -amylase. The  $\alpha$ -enzyme is inactivated almost completely at 55° in 30 min. whilst the  $\beta$ -enzyme is active after 30 min. at 65°. The optimum temp. of incubation of the two forms are:  $\alpha$ , 30—40°;  $\beta$ , 50°. Milk from cows suffering from mastitis has a high but variable diastatic activity. W. L. D.

**Enzymic amylolysis. V. Action of  $\alpha$ -amylase from malt on constituents of starch.** M. SAMEC [with M. BATTISTIN] (Z. physiol. Chem., 1937, 248, 117—128; cf. A., 1936, 1298).—The rate of saccharification of the amylo-compounds of potato-starch by  $\alpha$ -amylase from malt is  $>$  that of the erythro-compounds (I) whilst the reverse holds for saccharification with  $\beta$ -amylase. The greater is the concn. of (I), the earlier does the reaction cease and the smaller is the extent of saccharification. The residue from the hydrolysis of starch by  $\beta$ -diastase is probably derived from (I). W. McC.

**Enzymic hydrolysis of 6-halohydrin- $\beta$ -D-glucosides and of related compounds.**—See A., II, 399.

**Activity of the phosphatase of the long bones [of rats] at various stages of growth.** J. ROCHE and A. FILIPPI (Compt. rend. Soc. Biol., 1937, 125, 1064—1066).—At the end of growth the phosphatase

system of the long bones has a max. activity; differences in activity occur in the tibia and femur.

H. G. R.

**Enzymes of fermentation. VII. Phosphorylation of hexoses by yeast extracts.** A. SCHÄFFNER (Z. physiol. Chem., 1937, 248, 159—173).—Confirmation of previous results (A., 1935, 1026) is found in the observation that the hexose monoester fraction corresponds quantitatively with the amount of  $H_3PO_4$  esterified during the phosphorylation of hexoses by the purified enzyme system; phosphoglyceric acid (I) is isolated as the Ba salt. A marked difference exists between induction with (I) and with hexose phosphate since the change with the former is completely inhibited by 0.0005M-NaF whilst with the latter it is scarcely affected by 0.001M-NaF. Thus regeneration of the hexose diphosphate can occur in a manner not included in the extended Meyerhof scheme, probably by direct phosphorylation by union with inorg.  $PO_4'''$ . Homogeneous cozymase has the same phosphorylating action as the crude material so that cozymase must be an essential link in phosphorylation whereas adenylic acid and co-dehydrase II are unnecessary. The "intermediate enzyme" of Warburg and Christian is not homogeneous but the apodehydrogenases (I) contained therein cannot induce phosphorylation. Preservation of the enzyme in alkaline solution causes loss of phosphorylating action without diminishing the (I). This inactive solution can regain its phosphorylating power by addition of certain enzyme solutions which are themselves inactive. (I) can be pptd. from its solution by acids and the residual solutions after admixture with the enzyme solutions inactivated by alkali induce phosphorylation. Complete activity is restored when the solution of (I) is mixed with a dialysed glycerol extract of dried yeast which does not contain (I) and alone cannot cause phosphorylation. The phosphorylation system therefore consists of at least two components, the system of (I) and the component sensitive to alkali for which the name phosphatase is retained. The latter is not identical with any known phosphatase or with phosphorylase. H. W.

**Mechanism of alcoholic fermentation.** O. MEYERHOF, W. KIESSLING, and W. SCHULZ (Biochem. Z., 1937, 292, 25—67).—In the mechanism suggested by Warburg and Christian (this vol., 31), the enzymic A-protein (I) catalyses the transfer, by the adenylic acid (II) system, of  $PO_4'''$  from phosphopyruvic acid (III) to give glucose (IV) and hexose monophosphate (V) whilst the B-protein (VI) catalyses the oxidation-reduction, the uptake of inorg.  $PO_4'''$  involved in the (II) system, and all the equilibrium reactions. (V), in presence or absence of (IV), and hexose diphosphate (VII) are rapidly and completely converted into phosphoglyceric acid and  $AcCO_2H$  when  $AsO_4'''$  is present; in presence of (VI), but not of (I), the change does not proceed beyond (III) or (V), respectively. (V) is invariably the first product of phosphorylation and is an essential intermediate. W. McC.

**Isolation of pure cozymase from the muscle of warm-blooded animals.** S. OCHOA (Biochem. Z., 1937, 292, 68—73).—Cozymase, identical with that of yeast, is obtained in 0.06% yield from fresh rabbit's

muscle by a modification of the procedure of Meyerhof and Ohlmeyer (this vol., 313). W. McC.

**Pyrophosphatase. II. Mechanism of activation of phosphatases.** E. BAUER (Z. physiol. Chem., 1937, 248, 213—226; cf. A., 1936, 896).—Pyrophosphate (I) is not hydrolysed by pyrophosphatase (II) from bottom yeast in the absence of Mg [which probably activates (I)], a (I)–(II) compound being subsequently produced. The extent of action of (II)  $\propto$  [Mg] and to the amount of (II), and varies also with [(I)]. The amount of Mg required for optimal action depends on  $p_H$ , the optimal  $p_H$  shifting to the alkaline side as [(I)] increases. The action of (II) is inhibited by NaF but the effect can be reversed by increasing [Mg] and substrate concn.  $CaCl_2$  and adenosinetriphosphoric acid also inhibit the action of (II), the effect of  $CaCl_2$  being reversed by increasing [Mg]. W. McC.

**Production of phosphoglyceric acid.** P. OSTERN and A. J. GUTHKE (Z. physiol. Chem., 1937, 248, 155—158).—The method of Neuberg and Kobel (A., 1934, 56) succeeds only when the yeast is fermenting vigorously before PhMe is added. Addition of hexose diphosphate is unnecessary and a yield of 70 g. of Ba phosphoglycerate is obtained from 1225 c.c. of 40% aq. glucose. W. McC.

**By-products in the preparation of cozymase from yeast.** F. SCHLENCK and W. GLEIM (Svensk Kem. Tidskr., 1937, 49, 181—184).—Adenylic acid and codehydrogenase II (triphosphopyridine nucleotide) have been obtained. M. H. M. A.

**Biocatalysts of yeast.** G. MEDVEDEV and N. S. VISSOTZKAJA (Fermentforsch., 1937, 15, 257—263).—The amount of biocatalysts which must be added to yeast in order to produce a given abs. rate of fermentation  $\propto$  the amount of living yeast used. Preps. containing biocatalysts should be compared on the basis of the no. of mg. which cause liberation of 5 mg. of  $CO_2$  in 1 min. at 30° when 1 g. of yeast is used. Added biocatalysts act only after passing into the living yeast cells where production of complexes occurs. During fermentation, the complexes pass out into the surrounding medium. W. McC.

**Effect of crystalline hormones on the growth of yeasts.** A. P. WEBER (Ann. Ferm., 1937, 3, 15—29, 65—86).—The growth (rate of formation of dry matter) of *Rhodotorula sugari* and of *R. glutinis*, var. *Saitoi*, is stimulated by folliculin, dihydrofolliculin benzoate, or testosterone at a concn. of 0.0001%, the activity depending on the rate of growth. The effect of androsterone, insulin, thyroxine, or heteroauxin is less marked, whilst adrenaline shows no action. The activity of the hormones is small in the absence of Zn and is augmented by addition of Th, Mn, Cu, I, and B. Other yeasts examined were not affected by the hormones. H. G. R.

**Factors influencing radiosensitivity.** G. HARKER (J. Cancer Res. Comm. Sydney, 1937, 8, 14—23; cf. A., 1936, 523).—Addition of 0.1—1.0% of KCl,  $KHCO_3$ , KI, or  $MgCl_2$  increases the invertase action of yeast preps. whilst the subsequent effect of Ra irradiation is inhibited by 10—60%;  $CaCl_2$  is without action on either phase. Data for the direct action of

added inorg. and org. salts and their mixtures are given; Na succinate strongly inhibits. The bearing of the results on the efficacy of irradiation of tumours is discussed. F. O. H.

**Toxic action of substances which give rise to hydrochloric acid on hydrolysis.** H. MAGNE and P. RÉMY (Bull. Soc. Chim. biol., 1937, 19, 1092—1104).—The reproduction of yeast is much more sensitive than the respiration and fermentation to small concns. of  $(C_2H_4Cl)_2S$  (I) and trichloroethylamine (II). The hydrolysis products thiodiglycol,  $N(C_2H_4OH)_3$ , and HCl are practically non-toxic. The toxic action of (I) and (II) is related to their intracellular hydrolysis and not to the extracellular hydrolysis products. P. W. C.

**Effect of cysteine on respiration and fermentation of bakers' yeast.** J. RUNNSTRÖM, A. RUNNSTRÖM, and E. SPERBER (Naturwiss., 1937, 25, 540).—The addition of a small amount of cysteine (I) to yeast causes no change in its characteristic respiration, but the aerobic changes occurring after addition of glucose are entirely altered. Respiration decreases considerably, but there is strong aerobic fermentation. Addition of (I) does not accelerate and possibly retards anaerobic fermentation. Aerobic fermentation also increases after addition of thioglycollic acid. When F' and glucose were added simultaneously with (I) to yeast under anaerobic conditions, fermentation ceased. Under aerobic conditions F' exerted no influence. A. J. M.

**Processes in the synthesis of yeast cell-substance. Assimilation of nitrogen from amino-acids by yeast.**—See B., 1937, 965.

**Polysaccharide synthesis in the yeast cell.** K. F. BONHOEFFER and G. GÜNTHER (Naturwiss., 1937, 25, 459).—When yeast is grown on a medium containing 50% of  $D_2O$ , the polysaccharides formed contain a quantity of D which depends on the type of sugar present in the medium. Thus the glycogen (I) fraction contained 8.3, 8.6, and 4.5% of D according as to whether the sugar employed was glucose (II), mannose (III), or fructose (IV). The smaller D content when (IV) was used suggests that the synthesis of (I) from this sugar is more direct than that from (II) or (III). W. O. K.

**Zymosterol and ascosterol.**—See A., II, 416.

**New species of yeast of the genus *Zygosaccharomyces*: *Z. Ashbyii*.** M. CORDOC'H (Ann. Ferm., 1937, 3, 87—104).—The yeast, which is probably a variety of *Z. Marxianus*, has been isolated from diseased sisal. Biochemical characteristics are recorded. H. G. R.

**New black-pigmented species of *Torula* [*T. schænii*].** N. ROUCHELMAN (Ann. Ferm., 1937, 3, 149—155).—A more detailed account of work already reviewed (this vol., 143). H. W.

**Capsules of *Mycotorula albicans* and other yeast-like fungi.** P. NEGRONI (Folia biol., 1935, 1, 235—236).—A sp. polysaccharide isolated from the capsules was sol. in  $H_2O$ , acted as a hapten, and did not cause formation of antibodies when injected into animals. It gave a complement fixation reaction

with serum of rabbits immunised with the whole organisms, and a precipitin reaction with certain immune sera. CH. ABS. (p)

**Mathematical expression of the growth of *Aspergillus niger* as a function of the magnesium concentration of the medium.** J. LAVOLLAY and (MME.) F. LABOREY (Compt. rend., 1937, 204, 1686—1687).—The yield of *A. niger* depends on the [Mg] in the medium and not on its abs. amount. 1.05 mg. of Mg per 100 c.c. of Raulin's medium leads to max. development. J. L. D.

**Protein from *Aspergillus niger*.** P. DIATSCHECHENKO (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 30—35).—The "proto-oid" is prepared by Perov's method (A., 1936, 1037). The N content of various protein preps. (not obtained pure) was 12.25—15.27%. CH. ABS. (p)

**Toxins of *Fusarium bucharicum*, Jacz, and *F. graminearum*, Schw.** S. MEDVEDEVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 503—508).—When *F. bucharicum* and *F. graminearum* are grown on modified Richard medium of  $p_H$  5.27 the latter develops a more alkaline reaction ( $p_H$  6.97 and 6.48, respectively) and contains  $NH_3$  (21.74 and 19.73 mg., respectively, per 100 c.c.). The culture fluids, after removal of the fungi contained a toxin, apparently thermo-stable. Methods for the detection of the latter are described. W. O. K.

**Gas requirements of *Penicillium Roquefortii*.**—See B., 1937, 972.

**Antagonistic action of *Trichoderma* on *Actinomyces scabies* and *Rhizoctonia solani*.** R. H. DAINES (Amer. Potato J., 1937, 14, 85—93).—*T. lignorum* produces a diffusible substance which is toxic to *A. scabies* and to *R. solani*. The substance is destroyed by aeration of the soil, and may be absorbed by C. A soil bacterium produces a substance which is toxic to *T. lignorum* and to *A. scabies*. A. G. P.

**Growth factor influencing the development of *Ophiobolus graminis*, Sacc.** G. W. PADWICK (Sci. Agric., 1936, 16, 365—372).—An essential growth factor for the organism occurs in certain plant and animal extracts (carrots, casein) and in certain bacterial cultures. A. G. P.

**Nutrition of flagellates—Tetramitidæ. Sterols as growth factors for *Trichomonas*.** R. CAILLEAU (Ann. Inst. Pasteur, 1937, 59, 137—172).—A study of the conditions of multiplication of *Eutrichomastix colubrurum*, *T. fetus*, and *T. columbæ*. Cholesterol is essential for the growth of *T. columbæ*. E. M. W.

**Doctrine of pleomorphism in bacteriology.** S. WINOGRADSKY (Soil Sci., 1937, 43, 327—340).—A crit. review. A. G. P.

**Micro-organisms and vitamins.** S. ORLA-JENSEN (Ann. Ferm., 1937, 3, 1—14).—Lactic bacteria require an activator similar to bios (I) and lacto-flavin (II) for their development. A method for comparative determination of these substances in media is described. Peptone contains (II) and small quantities of (I). H. G. R.

**Acetone-butyl alcohol fermentation.** A. JANKE and V. SIEDLER (Biochem. Z., 1937, 292, 101—115).—In the mixture produced by addition of *B. acetobutylicus* to glucose fermented by aq. extract of yeast, addition of MeCHO increases the ratio BuOH : COMe<sub>2</sub> from 1.7 : 1 to 4.7 : 1 and from 2.9 : 1 to 22 : 1 if CaCO<sub>3</sub> is also added. When suspensions,  $p_H$  6.0, of the washed bacilli are used, no COMe<sub>2</sub> but equimol. amounts of BuOH and PrCO<sub>2</sub>H and of EtOH and AcOH are produced. Hence production of COMe<sub>2</sub> and that of BuOH are not interdependent. PrCO<sub>2</sub>H is produced but not COMe<sub>2</sub> or BuOH when aldol, which does not kill the bacillus, is added to the suspension at  $p_H$  6.3. The suspension produces no COMe<sub>2</sub> or BuOH from added AcOH. Aldol is possibly an intermediate in production of COMe<sub>2</sub> and BuOH but production of COMe<sub>2</sub> from AcOH or of BuOH from PrCO<sub>2</sub>H or aldol in the suspensions is thermodynamically improbable. W. MCC.

**Occurrence of phosphoglyceric acid in bacterial dissimilation of glucose.** R. W. STONE and C. H. WERKMAN (Biochem. J., 1937, 31, 1516—1523).—All the organisms investigated, except the strict anaerobes (e.g., *Clostridium*), grown in media containing glucose and hexose diphosphate, yield glycerophosphoric acid (I). The formation is accelerated by aeration and retarded by storage at 5°. Optimum conditions include the presence of a H acceptor appropriate to the organism, e.g., CHAcMe·OH for the colon-*aërogenes* group and AcCO<sub>2</sub>H for propionic bacteria. The role of (I) in bacterial glycolysis is discussed. F. O. H.

**Action of *B. coli* on conjugated bile acids.** K. P. BASU and S. C. CHAKRAVARTY (Indian J. Med. Res., 1934, 21, 691—694).—When Na taurocholate (I) is incubated at 37° with a suspension of *B. coli* in PO<sub>4</sub>''' buffer at  $p_H$  6.8 or 8.03, no hydrolysis of (I) occurs, but at  $p_H$  8.03 a small quantity appears to be destroyed. W. O. K.

**Adaptability of glucosylase and galactosylase in *Bacterium coli*.** M. STEPHENSON and E. F. GALE (Biochem. J., 1937, 31, 1311—1315).—The rate of glycolysis ( $Q_{glucose}$ ) with washed suspensions of *B. coli* is approx. doubled by changing from highly aerobic to anaerobic growth conditions, the increase being obtained on addition of 1% glucose (I) or galactose (II) to the growth medium. (II) ferments at an extremely low rate and this is not raised by addition of (I) but is increased 40-fold on adding 1% of (II) to the medium. The increase is not attained when (I) and (II) are simultaneously present. Adaptation to (II) is invariably accompanied by growth; increase in  $Q_{galactose} \propto$  the no. of cells which have multiplied in presence of the sp. substrate. P. W. C.

**Factors influencing bacterial deamination. I. Deamination of glycine, *dl*-alanine, and *l*-glutamic acid by *Bacterium coli*.** M. STEPHENSON and E. F. GALE (Biochem. J., 1937, 31, 1316—1322).—The chief effect of glucose on the oxidative deamination of glycine (I), *dl*-alanine (II), and *l*-glutamic acid (III) is to inhibit formation of deaminase (IV) during growth. With one strain of *B. coli* the inhibition amounted to 95% for all three acids. It is

not due to anaerobiosis arising during fermentation nor to change of  $p_H$  since these were controlled. Anaerobic conditions during growth also inhibit (IV) formation with (I) and (II) but favour it with (III). Presence of the sp.  $NH_2$ -acid in the growth medium does not affect formation of (IV) and age of culture between 8 and 20 hr. has only a slight effect.

P. W. C.

**Toxin of *Bacterium coli*.** I. A. LIGAS (Boll. Soc. ital. Biol. sperim., 1937, 12, 141—143).—Intravenous injection of various fractions into rabbits indicates the following order of decreasing toxicity: exotoxin + autolytic products, polysaccharides (I) extracted from the bacteria (endotoxin), dead bacteria, dead bacteria deprived of (I).

F. O. H.

**Fermentation of glucose by bacteria of the *coli-aerogenes* group.** D. R. CANEPA and C. S. DE LA SERNA (Folia biol., 1935, 1, 238—243).—*Escherichia coli*, *Aerobacter aerogenes*, and intermediate forms all produce  $CO_2$ ,  $H_2$ , EtOH,  $CH_3CO_2H$ ,  $(OH\cdot CHMe)_2$ ,  $HCO_2H$ ,  $AcOH$ , lactic and succinic acids from glucose but the relative proportions of these products are different for each species. A means of identification is thus possible.

CH. ABS. (p)

**Proteinase of *Clostridium histolyticum*.** L. WEIL and W. KOCHOLATY (Biochem. J., 1937, 31, 1255—1267).—Studies of proteinase activity were made on bacteria-free filtrates of anaerobic cultures. The enzyme is extracellular and shows a  $p_H$  optimum of 7. It is not activated by enterokinase, but is activated by  $\cdot SH$  compounds. Heavy metals catalyse the activation. Maximum activation by cysteine- $Fe^{++}$  occurred under anaerobic conditions. The active group of the proteinase does not appear to be  $SH$ . Addition of an activator to dialysed preps. gives an increase in activity which is independent of the purity of the prep. or variations in substrate or in the composition of the culture medium. The proteinase activity of cultures increased with growth of the organisms, reaching a max. after 24 hr., and then decreasing.

J. L. C.

**Chemical influences of bacteria on blood-pigments.** M. KUROVA (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, 1, 311—320).—Hamatin (I) was produced by cholera or  $H_2O$  vibrios. Under aerobic conditions oxyhæmoglobin was changed into (I) and methæmoglobin.

CH. ABS. (p)

**Favourable effect of yeasts on the utilisation of carbohydrates and production of toxin by the diphtheria bacillus.** P. BORDET (Compt. rend. Soc. Biol., 1937, 125, 1044—1046).—Addition of baker's yeast to the medium augments production of the toxin by reason of increased utilisation of carbohydrates.

H. G. R.

***Corynebacterium diphtheriæ*.** M. T. CASASSA (Patologica, 1935, 27, 726—737).—Growth of the organism in various media is examined. All media, initially at  $p_H$  7.0—7.2, became acid ( $p_H$  6.0—6.8) within 24 hr. Different strains behaved differently towards sugars. Toxin production was favoured by aerobic conditions and  $p_H$  near 7, and was least in organisms showing the greatest tendency to acidify the substrate.

CH. ABS. (p)

**Porphyrin of toxic diphtheria broth.** M. PAIO (Ann. Inst. Pasteur, 1937, 59, 197—206).—The absorption spectrum of broth containing diphtheria toxin can be reproduced by a mixture of coproporphyrin (I) and broth, showing (I) to be the characteristic constituent.

E. M. W.

**Nicotinic acid as growth accessory for diphtheria bacillus.** J. H. MUELLER (J. Biol. Chem., 1937, 120, 219—224).—The isolation of 3.3 × 10<sup>-6</sup>% of nicotinic acid (I) from liver is described. (I) exerts its max. effect on the growth of *B. diphtheriæ* when present in a concn. of about 1 × 10<sup>-4</sup>%, and is approx. ten times as effective as nicotinamide.

J. N. A.

**Physiological rôle of hæmin for *Haemophilus influenzae*, Pfeiffer.** A. LWOFF and M. LWOFF (Ann. Inst. Pasteur, 1937, 59, 129—136).—The  $O_2$  consumption of *H. influenzae* near the min. dose of hæmin (I) permitting growth ∝ (I) concn. Hence (I) is a necessary constituent of a respiratory enzyme system.

E. M. W.

**Influence of hydrogen-ion and lactic acid concentration on the growth of *Bacillus putrificus*.** H. HOSTETTLER and E. ZOLLIKOFER (Z. physiol. Chem., 1937, 248, 183—196).—Addition of lactic acid (I) hinders the development of *B. putrificus verrucosus*, Zeissler, both through H and undissociated acid mols. In absence of (I) the tolerated  $[H^+]$  depends on the nature and properties of the culture medium, the lowest  $p_H$  val. being observed in the presence of glucose. The different races of bacteria show varying sensitiveness towards  $[H^+]$  according to the culture medium. The inhibitory action of undissociated (I) is observed at a concn. of  $1.5 \times 10^{-5}N$  and the fatal concn. in the cases of five races is  $4.19 \times 10^{-3}$ ,  $3.48 \times 10^{-3}$ ,  $3.64 \times 10^{-3}$ ,  $3.15 \times 10^{-3}$  and  $2.89 \times 10^{-3}N$ . It is const. for each race with a given culture medium. In absence of (I) the temp. (25° or 37°) of cultivation is without influence on the growth of the organism. In the series with addition of (I) the limiting  $p_H$  vals. at 25° are > at 37°. At 25° (I) inhibits > at 37°. The lethal concn. of (I) depends on the culture medium.

H. W.

**Chemotherapy of pneumococcal infection by di-(*p*-acetamidophenyl)sulphone (1399F).** E. FOURNEAU, J. TRÉFOUËL, (MME.) J. TRÉFOUËL, F. NITTI, and D. BOVET (Compt. rend., 1937, 205, 299—300; cf. this vol., 359).—(*p*- $NH_2$ - $C_6H_4$ )<sub>2</sub>SO<sub>2</sub> (I) has 10 times the antistreptococcal activity of *p*- $NH_2$ - $C_6H_4$ -SO<sub>2</sub>- $NH_2$  (II), about the same as (*p*-NO<sub>2</sub>- $C_6H_4$ )<sub>2</sub>SO<sub>2</sub>, and < (*p*- $NH_2$ - $C_6H_4$ )<sub>2</sub>SO<sub>2</sub>. The antipneumococcal activity of (I) is 10 times that of (II) and it is effective against different strains of bacilli.

J. L. D.

**Phenol-resistance of *Staphylococcus aureus*.** E. E. VICHER, E. MEYER, and E. N. GATHERCOAL (J. Amer. Pharm. Assoc., 1937, 26, 590—593).—Various strains of *S. aureus* show marked differences in their resistance to PhOH and also day-to-day variations in the resistance of individual strains.

F. O. H.

**Spectrographic identification of nicotinic acid in *Staphylococcus aureus* growth factor concentrates.** E. R. HOLIDAY (Biochem. J., 1937, 31,

1299—1302).—The absorption spectrum of a *S. aureus* growth factor concentrate is measured in 0.1N-HCl and -NaOH and compared with those of  $C_5H_5N$ , 3-cyanopyridine, nicotinic acid (I), and nicotinamide and the presence of (I) in the concentrate deduced. From the increase in extinction coeff. on acidifying an alkaline solution of concentrate as compared with that for a solution of pure (I), the amount of (I) in the concentrate is estimated as 1.47%. P. W. C.

**Culture of mastitis streptococci from milk.** IV. **Selective media.** M. KLIMMER and G. WEISKE (Milch. Forsch., 1937, 19, 15—22; cf. B., 1937, 489).—A sucrose-albuminate-bromocresol-purple agar medium is best for separation on plates from high-count milk. Small colonies with cloudy edges, dark yellow ring, and dark centres are identified by being Gram-positive and growing in methylene-blue- and litmus-milk. Some indications of further selectivity were obtained by adding Me-violet or  $NaN_3$  to the medium. W. L. D.

**Antistreptococcal action of organic sulphides.** P. GLEY (Compt. rend., 1937, 204, 1907—1908; cf. Buttle *et al.*, this vol., 302).— $p$ -NHAc- $C_6H_4$ -SO<sub>2</sub>H has an antistreptococcal activity in mice < that of carboxysulphamidochrysoidine (I) whilst the activity of  $p$ -NHAc- $C_6H_4$ -SH is about equal to that of (I).

J. L. D.

**Action of organic salts on the development of the bovine type of tubercle bacilli.** A. ROSA and R. MACCOLINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 183—184).—Neutralisation of the N-NaOH used in the prep. of the cultures of the bacillus by AcOH significantly retards subsequent growth. This does not occur with the human type, or with the bovine type when lactic acid is used. F. O. H.

**Cellular reactions to wax-like materials from acid-fast bacteria. Unsaponifiable fraction from the tubercle bacillus, strain H-37.** F. R. SABIN, K. C. SMITHBURN, and R. M. THOMAS (J. Exp. Med., 1935, 62, 751—769).—The unsaponifiable fraction stimulates blood cells, causing formation of new monocytes which surround the wax-like particles and then fuse into giant cells within which the waxes slowly disintegrate without damage to the cells.

CH. ABS. (p)

**Chemical nature of the hapten-lipoid stabiliser of tubercle bacilli. Chemistry of the purified active fraction.** M. A. MACHEBŒUF, G. LEVY, and M. FAURE (Compt. rend., 1937, 204, 1843—1845; cf. A., 1927, 1114).—Treatment of the active fraction (cf. A., 1935, 899) dissolved in NaCl with  $Et_2O$ -COMe<sub>2</sub> or EtOH affords a ppt. with alexic properties but which is contaminated with a polyside and when hydrolysed gives rather >2% of reducing sugar (cf. this vol., 36). The phosphatide acids (I) in the fraction occur mainly as Mg salts with some Ca and Na. (I) decompose in the free state and the hapten activity diminishes and disappears. With N-H<sub>2</sub>SO<sub>4</sub> at room temp. the fraction gives saturated fatty acids but no free H<sub>3</sub>PO<sub>4</sub>, which is linked to the polyhydric alcohols. Controlled hydrolysis with Ba(OH)<sub>2</sub> at 100° yields a mixture of Ba salts of inositol-, and glycerophosphoric acids. The free acids are hydro-

lysed by H<sub>2</sub>O at 134° under pressure. One of the Ba salts contains P and inositol. J. L. D.

**Chaulmoogra oil and morphological modifications of *Mycobacterium tuberculosis*.** F. BAL-SAMELLI (Boll. soc. intern. microbiol. Sez. ital., 1935, 7, 341—343).—The ethylated oil has a sp. action on the organism, modifying its resistance to acids and favouring granular decomp. CH. ABS. (p)

**Polysaccharide of the typhus bacillus.** VI. **Toxic action.** A. SPANEDDA (Boll. Soc. ital. Biol. sperim., 1937, 12, 143—144; cf. A., 1936, 1010).—The symptoms of toxic action in rabbits and guinea-pigs (lethal dose 2 and 5 mg. per kg., respectively) are described. F. O. H.

**Chemical and physical factors causing bacteriolysis.** A. C. H. YEN (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, 1, 303—309).—The action of electricity on bacterial suspensions results from the effect of substances produced by electrolysis. Bacteriolysis occurs only when OCl', OBr', or OI' is formed. Acids or hydroxides formed by electrolysis accumulate in too small concn. to cause lysis. CH. ABS. (p)

**Determination of the size of the bacteriolysins of *Actinomyces* by ultrafiltration.** M. WELSCH and W. J. ELFORD (Compt. rend. Soc. Biol., 1937, 125, 1053—1056).—The diameter of the bacteriolysins is 4.4—5.2 mμ. H. G. R.

**Bacteriolytic action of menthol.** G. PACHECO and M. PARA (Compt. rend. Soc. Biol., 1937, 125, 1099—1100).—Menthol at low concns. has a bacteriolytic action which is reduced by lecithin. H. G. R.

**Virus in the ætiology of rheumatic diseases.** G. H. EAGLES, P. R. EVANS, A. G. T. FISHER, and J. D. KEITH (Lancet, 1937, 233, 421—429).—Sera from patients with rheumatic fever, chorea, and rheumatoid arthritis agglutinate suspensions from the corresponding disease. Cross-agglutination occurring within the whole group indicates a similar virus ætiology for all three diseases. L. S. T.

**Fluorescence microscopy on living virus with oblique incident illumination.** F. HIMMELWEIT (Lancet, 1937, 233, 444—445).—The technique demonstrates, by the fluorescence of primulin or Titan-yellow 2GS, the elementary bodies of living viruses in the cells of living, infected tissue.

L. S. T.

**Isolation and some properties of liquid crystalline substances from solanaceous plants infected with three strains of tobacco mosaic virus.** F. C. BAWDEN and N. W. FRIE (Proc. Roy. Soc., 1937, B, 123, 274—320).—Infective nucleoproteins exhibiting characteristic optical properties were isolated from solanaceous plants infected with three strains of tobacco mosaic virus, but not from healthy plants. Solutions of the proteins (>2%) separate into two layers: the lower layer is more conc. and is birefringent; the upper layer shows anisotropy. The activity per unit solid content is the same for both layers. Effects of certain chemicals on activity, and the stability of the nucleic acid-protein complex to heat and drying, are examined.

In purified preps. the complex exists as rod-shaped particles formed by linear aggregation of constituent units. In the plant the particles are probably not completely aggregated. A. G. P.

**Isolation of high-molecular proteins by the ultracentrifuge.** R. W. G. WYCKOFF (Naturwiss., 1937, 25, 481—483).—The crystallisation, directly from the crude sap, of the virus of the tobacco mosaic disease (mol. wt.  $17 \times 10^6$ ) is effected by differential centrifugation. Less stable plant viruses, which cannot be crystallised by other methods, when purified in this way, proved to be cryst. proteins of similar mol. wt. Similarly the virus of rabbit papillomatosis has been isolated as a protein of mol. wt.  $25 \times 10^6$ . W. O. K.

**Orange-juice for the aerobic culture of anaerobic bacteria.** V. CIANCI and C. PALMIERI (Boll. Soc. ital. Biol. sperim., 1937, 12, 110—113).—Orange-juice gives results superior to those due to using equiv. amounts of vitamin-C. F. O. H.

**Chemotherapy.** F. L. PYMAN (Chem. and Ind., 1937, 789—794).—Recent work on bactericides and amœbicides is reviewed. Investigation of the activity of a large no. of alkylharmols led to the view that the harmol residue might not be an important contributor to amœbicidal properties. Attachment of the group  $\text{NBu}_2[\text{CH}_2]_{10}$  to a substituted  $\text{NH}_2$  gave high activity. The min. amœbicidal concn. of a long series of paraffins  $\text{NRR}'[\text{CH}_2]_n\text{NRR}'$  was determined. Of the series  $\text{NR}_2[\text{CH}_2]_{10}\text{NR}_2$ ,  $\alpha$ -tetra-*n*-amyldiaminodecane had only 0.1 of the toxicity of emetine to mice when given orally and  $\frac{1}{8}$  when given subcutaneously and was 3—5 times as efficient in tests *in vitro*, but was not sufficiently active in man in amœbic dysentery to be of any real val. P. W. C.

**Oligodynamic action of silver.** H. FROMHERZ and J. HEISS (Angew. Chem., 1937, 50, 679—681).—The effects of the presence of pure and treated Ag wire in cultures of *Staphylococcus aureus* show that the bactericidal action depends on the presence of  $\text{Ag}^+$  ( $< 2 \times 10^{-11}$  mol. per litre) which have their origin in Ag salts present as impurities or in the oxidised surface film. S. M.

**Hormones as physiological stimulants.** H. FITTING (Biol. Zentr., 1936, 56, 69—86; Chem. Zentr., 1936, i, 3706).—A lecture. A. G. P.

**Osteodystrophy and hormone influence.** J. MARX (Orvosi Het., 1935, 79, 1262—1264).—Thymus and spleen as well as the secondary thyroid gland are concerned in Ca metabolism. Increased calcification caused by artificial hyperfunction of the secondary thyroid was not prevented by simultaneous administration of spleen and thymus preps.

CH. ABS. (*p*)

**Influence of adrenaline on resorption from subcutaneous tissues.** J. FALCK and E. LANGZ (Klin. Woch., 1935, 14, 1209—1211; Chem. Zentr., 1936, i, 3708).—Addition of adrenaline (I) inhibits the resorption of subcutaneously administered  $\text{MgSO}_4$ . No such effect occurs if (I) is injected simultaneously with  $\text{MgSO}_4$  but in other tissues. Sympatol has no action on Mg resorption. A. G. P.

**Comparative effect of adrenaline and of glucose on the utilisation of sugar by the muscles, determined with the aid of thermostromuhr measurements of blood flow.** S. SOSKIN, H. E. ESSEX, J. F. HERRICK, and F. C. MANN (Amer. J. Physiol., 1937, 118, 328—332).—Continuous intravenous injection of adrenaline in the dog appears to have no effect on sugar utilisation. R. N. C.

**Lachrymal elimination of glucose during adrenaline hyperglycæmia.** D. MICHAEL, P. VANCEA, and N. ZOLOG (Compt. rend. Soc. Biol., 1937, 125, 1095—1096).—Excretion of glucose in the tears commences when the blood-sugar is increased by 30—40%. H. G. R.

**Adrenaline content of the adrenal glands.**  
I. Determination in small laboratory animals.  
II. Determination in rabbits and dogs killed by slow and rapid hæmorrhage, traumatic destruction of the medulla [oblongata], and gaseous emboli.  
III. Content in rabbits anaesthetised or killed with ether or chloroform.  
IV. Content in rabbits poisoned with phosphorus or strychnine.  
V. Determination in animals after fatal insulin shock, combined action of insulin and atropine, or anaphylactic shock. F. MARCONI and I. DI MARCO (Boll. Soc. ital. Biol. sperim., 1937, 12, 164—165, 165—166, 166—168, 168—169, 169—170).—I. Weller's method (A., 1934, 332) indicates an adrenaline (I) content of 1.312 (per g.), 0.176 (total), and 0.119 mg. (total) in the glands of dogs, rabbits, and guinea-pigs, respectively.

II. Death due to air emboli or slow hæmorrhage results in a very low content of (I). Rapid hæmorrhage or destruction of the medulla oblongata has little effect.

III.  $\text{Et}_2\text{O}$  narcosis produces little change whilst  $\text{CHCl}_3$  narcosis (especially when lethal) diminishes the (I) content.

IV. With both forms of poisoning, the (I) content is reduced to zero vals.

V. Large doses of insulin, with or without atropine, produce an almost complete disappearance of (I) from the glands of dogs and rabbits. Anaphylactic shock (horse serum) in guinea-pigs has little effect on the (I) content. F. O. H.

**Cytology of the adrenal.** F. F. MCKENZIE and L. J. NAHM (Ann. Rept. Montana Agric. Exp. Sta. Bull. [1933], 1934, No. 340, 13).—Changes in the fat and mitochondrial content of cortical cells during the œstrous cycle involved variation in the no. and size of fat globules in the glomerular zone. The fat content increased in pro-œstrus and early œstrus, reaching a max. in early metœstrus and decreasing throughout diœstrum. Changes in the fat content of cells of the zona fasciculata and zona reticularis closely paralleled the above. CH. ABS. (*p*)

**Sodium chloride balance in the adrenalectomised opossum.** S. W. BRITTON and H. SILVETTE (Amer. J. Physiol., 1937, 118, 21—25).—Serum-Na and -Cl are definitely increased in adrenal insufficiency in the fasting state, whereas in the higher mammalian species they fall. Administration of  $\text{H}_2\text{O}$  causes falls

in the Na and Cl levels, which are augmented in lactation or diarrhoea. Serum-sugar and liver- and muscle-glycogen are decreased. R. N. C.

**Maintenance of adrenalectomised dogs without cortin through control of the mineral constituents of the diet.** W. D. ALLERS and E. C. KENDALL (Amer. J. Physiol., 1937, 118, 87—94).—Administration of NaCl and Na citrate with the diet results in survival for long periods. R. N. C.

**Effect of cortin on the concentrations of some constituents of the blood of adrenalectomised rats.** D. J. INGLE, H. W. NILSON, and E. C. KENDALL (Amer. J. Physiol., 1937, 118, 302—308).—Cortin (I) does not prevent the increase in blood-urea after nephrectomy, or alter Na and Cl from their normal vals. Blood-sugar is slightly decreased, whilst serum-K is increased, the increase being associated with loss of muscular activity. (I) retards the increase of K in adrenalectomised animals injected intraperitoneally with H<sub>2</sub>O, but does not affect the increase of urea or the fall of Na and Cl which result from such injections. R. N. C.

**Effects of administering adrenotropic extract to hypophysectomised and thyroidectomised tadpoles.** W. J. ATWELL (Amer. J. Physiol., 1937, 118, 452—456). R. N. C.

**Comparison of sodium, chloride, and carbohydrate changes in adrenal insufficiency and other experimental conditions.** S. W. BRITTON and H. SILVETTE (Amer. J. Physiol., 1937, 118, 594—599).—Cats subjected to removal of adrenals, pancreas, or kidneys, different combinations of these, or intraperitoneal tissue transplants show decreases in serum-Na and -Cl, in some cases considerably > in adrenal insufficiency. The Na/Cl loss ratio is < normal, whereas in adrenal insufficiency it shows the normal val. Adrenalectomy causes falls of serum-sugar (I) and total carbohydrate of the body, but the other operations cause considerable increases of (I). R. N. C.

**Cortico-adrenal insufficiency: metabolism studies on potassium, sodium, and chloride.** H. W. NILSON (Amer. J. Physiol., 1937, 118, 620—631).—Adrenalectomised dogs on a diet low in K and high in NaCl and Na citrate require no cortical extract (I), but the positive balance of Na and Cl must be > that required by intact animals, and a uniform daily balance cannot be maintained. A high intake of K and a low intake of Na and Cl produce similar symptoms of adrenal insufficiency, which are associated with a high K level in the cells; blood-K returns to its normal levels on administration of (I) and/or Na<sup>+</sup>. Blood-urea is sometimes increased in adrenal insufficiency, and there are changes in blood-sugar, Na, Cl, and the hæmatocrit val., but only the increase in K is characteristic. R. N. C.

**Effects of cortico-adrenal extract on growth and sexual activities.** O. G. FITZHUGH (Amer. J. Physiol., 1937, 118, 677—689). R. N. C.

(A) **Effect of cortin on the sodium, potassium, chloride, inorganic phosphorus, and total nitrogen balance in normal subjects and in patients**

**with Addison's disease.** (B) **Effect of cortin on renal excretion of sodium, potassium, chloride, inorganic phosphorus, and total nitrogen in normal subjects and in patients with Addison's disease.** G. W. THORN, H. R. GARbutt, F. A. HITCHCOCK, and F. A. HARTMAN (Endocrinol., 1937, 21, 202—212, 213—219).—(A) Subcutaneous injections of 12—18 cat units of cortin per day produced no significant change in Na, K, and Cl balances in normal subjects. In patients with severe Addison's disease injection of 20 units daily changed the Na and Cl balances from negative to positive.

(B) Large intravenous injections (80 cat units) of cortin reduced the hourly excretion of Na and increased that of K in normal subjects and in patients with Addison's disease. There was no significant effect on the excretion of inorg. P or N. J. L. C.

**Importance of cortico-adrenal regulation of potassium metabolism.** R. L. ZWEMER and R. TRUSZKOWSKI (Endocrinol., 1937, 21, 40—49).—The level of plasma-K is actually raised by adrenalectomy, whilst K tolerance is lowered and administration of normal amounts of K causes marked symptoms. Injection of K salts into normal animals raises the blood-K and may produce similar symptoms. Injection of adrenal cortex extract lowers the blood-K of normal animals and protects against large amounts of K given intraperitoneally. M. A. B.

**Cortico-adrenal and neural effects on gonadotropic activity of the pituitary.** H. B. FRIEDGOOD (Science, 1937, 86, 84—85).—In cats the adrenal glands are essential for the proper coital stimulation of the anterior pituitary. The time, >1 hr., between mating and the gonadotropic response of the pituitary is consumed in the secretion, and possibly elaboration, of an adrenal cortical hormone, which can stimulate the gonadotropic activity of the anterior pituitary.

L. S. T.

**Effect of adrenalectomy and thyroidectomy on ketonuria and liver-fat content of the albino rat following injections of anterior pituitary extract.** E. G. FRY (Endocrinol., 1937, 21, 283—291).—Adrenalectomy following the injection of anterior pituitary extract suppressed the excretion of ketones and prevented fatty infiltration of the liver. The ketogenic response to the extract was permitted by the presence of adrenal cortical tissue but not by adrenal cortical extract therapy, and remained after thyroidectomy. J. L. C.

**Effect of adrenalectomy on the ketosis of fasting and on the action of the anterior pituitary ketogenic principle.** E. M. MACKAY and R. H. BARNES (Amer. J. Physiol., 1937, 118, 184—189).—Fasting ketosis in rats is reduced by bilateral adrenalectomy; ketosis caused by anterior pituitary extracts is abolished or reduced. (Cf. A., 1936, 1542.)

R. N. C.

**Effect of adrenalectomy on liver-fat in fasting and after the administration of anterior pituitary extracts.** E. M. MACKAY and R. H. BARNES (Amer. J. Physiol., 1937, 118, 525—527).—Ketogenic anterior pituitary extracts cause deposition of fat in the livers of fasting rats. Adrenalectomy abolishes both

ketogenesis and fat deposition, and also reduces the amount of fat deposited in the liver during fasting.

R. N. C.

**Carbohydrate metabolism of hypophysectomised and hypophyso-adrenalectomised rats.** E. L. COREY and S. W. BRITTON (Amer. J. Physiol., 1937, 118, 15—20).—Blood-sugar (I) rises for 30—40 days after complete hypophysectomy, and in long-surviving animals subsequently falls below normal. The changes are independent of wt. changes and the survival period. Liver- and muscle-glycogen (II) vary within normal limits. Adrenalectomy following hypophysectomy causes rapid falls in (I) and (II). Carbohydrate changes in the chronic state following hypophysectomy may be due in part to changes in the adrenal cortex.

R. N. C.

**Cortex- and medulla-stimulating action of the anterior lobe of the pituitary gland.** A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1937, 125, 1082—1085).—Aq. or acid extracts of the anterior lobe have no medulla-stimulating action. Acid, but not aq., extracts have a cortex-stimulating action on guinea-pigs which is inhibited by simultaneous administration of I.

H. G. R.

**Effect of an anterior pituitary extract on serum-calcium and -phosphorus.** H. B. FRIEDGOOD and R. MCLEAN (Amer. J. Physiol., 1937, 118, 588—593).—Serum-Ca in guinea-pigs is increased, but serum-PO<sub>4</sub> is unaffected; the action of the extract is therefore parathyrotropic.

R. N. C.

**Immediate hyperglycæmic and anti-insulin action of the anterior lobe of the pituitary gland and of the blood in acromegaly.** A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1937, 125, 1086—1088).—Massive doses of acid extract of the anterior lobe or of the blood-plasma in acromegaly have an immediate diabetogenic action on rabbits.

H. G. R.

**Assay of lactogenic extracts of anterior pituitary gland.** I. W. ROWLANDS (Quart. J. Pharm., 1937, 10, 216—221).—A method of assay using the pigeon crop-gland test is described. The response given by the gland increases with body-wt.

J. N. A.

**Pituitrin anæmia.** A. GILMAN and L. GOODMAN (Amer. J. Physiol., 1937, 118, 241—250).—The anæmia in rabbits is the result of H<sub>2</sub>O retention, which leads to blood dilution and destruction of erythrocytes.

R. N. C.

**Pituitary regulation of water exchange in the dog and monkey.** H. L. WHITE and P. HEINBECKER (Amer. J. Physiol., 1937, 118, 276—284).—A diuretic principle is present in the anterior pituitary. It is ineffective in absence of the thyroid, but is not the thyrotropic hormone.

R. N. C.

**Carbohydrate storage and maintenance in the hypophysectomised rat.** J. A. RUSSELL and L. L. BENNETT (Amer. J. Physiol., 1937, 118, 196—205).—Blood-sugar and liver- and muscle-glycogen maintain their normal levels when the food supply is kept normal, but fall to an extent > in normal animals on fasting even for short periods. The fall is not due to

absence of the posterior pituitary, brain injury, or chronic inanition. A single carbohydrate meal after fasting does not cause increases in body carbohydrates comparable with those produced in normal animals; the initial low fasting level and the low rate of absorption only partly explain this result.

R. N. C.

**Site of formation of the posterior lobe hormones.** C. FISHER (Endocrinol., 1937, 21, 19—29).—No diuretic, pressor, or oxytocic activity was shown by cat pituitaries in which degeneration of the pars nervosa had been produced experimentally, but in which the pars intermedia was still physiologically active. The elaboration of the diuretic, pressor, and oxytocic principles is in some way related to the pars nervosa.

M. A. B.

**Augmentation of ovarian weights as effected by zinc sulphate, antuitrin-S, and thyroid implants.** F. E. EMERY (Amer. J. Physiol., 1937, 118, 316—320).

R. N. C.

**Effect of the female sex hormone on reptiles.** V. DANTCHAKOFF (Compt. rend., 1937, 205, 424—426).—Histological.

**Determination of the gonadotropic material of urine of women after castration and the menopause and of normal men.** P. A. KATZMAN (Endocrinol. 1937, 21, 89—95).—Adsorption by BzOH gives complete recovery of the gonadotropic material from the urine of pregnancy and from anterior lobe extracts, but not from the urine of women after castration and the menopause, in which BzOH appears to cause a definite reduction in activity. Pptn. with EtOH gives complete recovery in all cases, and tungstic acid (I) is satisfactory if the basic reagent used for decomp. the ppt. is suitably chosen. With the urine of normal men BzOH, (I), and tannic acid all give satisfactory results.

M. A. B.

**Menstrual cycle of the primates. X. Estrone threshold of uterus of *Rhesus* monkey. XI. Part played by oestrogenic hormone in the menstrual cycle.** S. ZUCKERMANN (Proc. Roy. Soc., 1937, B, 123, 441—456, 457—471).—X. The effects of the injection of estrone (I) in spayed *Rhesus* monkeys in producing bleeding suggest that the (I) threshold fluctuates rhythmically.

XI. An artificial menstrual cycle is produced in spayed monkeys by the injection of (I) in increasing amounts for 14 days reduced to a const. low level on and after the 15th day. This cycle is significantly longer than one in which no (I) is injected after the 14th day. The data show that the (I) threshold fluctuates over a wide range. The mechanism of the menstrual cycle is discussed.

E. M. W.

**Production of oestrogenic hormone by a transplantable ovarian carcinoma.** L. C. STRONG, W. U. GARDNER, and R. T. HILL (Endocrinol., 1937, 21, 268—272).—Transplanted ovarian carcinoma in mice secreted oestrogen in amounts sufficient to produce (a) long-continued oestrous smears which reverted to dioestrous type after removal of tumours and (b) growth of rudimentary mammary glands of males.

J. L. C.



Tyrod solution containing insulin and in this respect resembles the behaviour of the liver of a hypophysectomised frog or a liver which has suffered prolonged perfusion.  
J. L. D.

**Vitamin-free diets and the action of insulin.** R. W. MARTIN (Z. physiol. Chem., 1937, 248, 242—255).—Pancreatectomised dogs on a diet almost free from vitamin- $B_1$  and  $B_2$  develop severe and ultimately fatal hyperglycaemia and glycosuria despite regular administration of adequate doses of insulin (I). The symptoms are only temporarily relieved by very greatly increased doses of (I) but the disease is rapidly cured by administration of  $B_1$  and  $B_2$  (but not by that of  $B_1$  alone). Hence (I) appears to act effectively only in presence of  $B_2$  or of  $B_1 + B_2$ . W. McC.

**Insulin tannate.** F. LUN (Compt. rend. Soc. Biol., 1937, 125, 1088—1090).—The activity of insulin (I) is not affected by addition of tannic acid (II) but the return of the blood-sugar to normal vals. is retarded. Addition of small quantities of  $Na_2S_2O_3$  to (I)-(II) preps. prolongs the hypoglycosuria. Addition of arginine does not affect the action of (I).  
H. G. R.

**Blood-glutathione during various experimental conditions.** III. Thyroparathyroidectomy and treatment with parathyroid hormone. P. CACCIALANZA (Boll. Soc. ital. Biol. sperim., 1937, 12, 119—120).—The operation in dogs reduces blood-glutathione (I), the normal vals. of reduced and total (I) decreasing from 0.039, 0.043 to 0.029, 0.031%, respectively. The decrease is prevented by injection of parathyroid hormone.  
F. O. H.

**Increased calcium appetite of parathyroidectomised rats.** C. P. RICHTER and J. F. ECKERT (Endocrinol., 1937, 21, 50—54).—The average daily intake of 2.4% aq. Ca lactate increased 4-fold after parathyroidectomy, but was only about half that calc. by MacCallum as necessary for normal growth. The intake returned to normal after parathyroid implantation.  
M. A. B.

**Action of parathormone.** III. H. K. GOADBY (Biochem. J., 1937, 31, 1530—1533; cf. A., 1936, 526).—The direct action of parathyroid hormone on the kidneys to produce increased excretion of  $PO_4'''$  is confirmed by the hormone producing a much smaller  $PO_4'''$  diuresis in persons suffering from nephritis than when they have recovered.  
F. O. H.

**Effect of calcium and parathormone on serum-calcium in normal, Eck-fistula, and gastrectomised dogs.** L. G. LEDERER and L. A. CRANDALL, jun. (Amer. J. Physiol., 1937, 118, 52—56).—Eck fistula lowers the fasting Ca level and lessens the rise of Ca after oral administration of Ca lactate (I) or gluconate (II), and the Ca-mobilising action of parathormone;  $CaCl_2$  injected intravenously is removed with abnormal rapidity. Gastrectomy results in a greater rise of Ca after oral administration of (I), but not after (II).  
R. N. C.

**Test for abnormally large amounts of parathyroid hormone in blood.** B. HAMILTON and W. J. HIGHMAN (J. Clin. Invest., 1936, 15, 99—100).—The serum is injected intramuscularly into the legs

of a rabbit which is then given 4 successive doses of  $CaCl_2$  (0, 1, 3, 5 hr.) by stomach tube. Results are interpreted on the basis of the increase in serum-Ca in the rabbit.  
CH. ABS. (p)

**Phloridzin diabetes and the endocrine system.** I. Thyroidectomy. II. Thyroidectomy and administration of cortical hormone. C. LOMBROSO (Boll. Soc. ital. Biol. sperim., 1937, 12, 133—134, 134—135).—I. The glycosuria due to phloridzin almost disappears after thyroidectomy.

II. The diminished glycosuria due to thyroidectomy returns to normal (diabetic) levels, or even higher, on administration of adrenal cortex hormone.  
F. O. H.

**Phospholipins of the brain, kidneys, and heart of white rats in hyperthyroidism.** A. WEIL (Endocrinol., 1937, 21, 101—108).—Feeding thyroid powder to male rats decreases body-wt. and increases wt. of heart and kidneys with corresponding increase in phospholipins (I). Aq.  $COMe_2$  extracts of kidneys and heart increase and of brain decrease. Total P and P of the different extracts increase proportionally to the increase in (I) and in wt. of the three organs. (I) are not changed qualitatively since there is no change in % P or the ratio total/lipin P.  
M. A. B.

**Thyroxine, di-iodotyrosine, and liver-glycogen.** F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1937, 12, 107—108).—Injection of di-iodotyrosine into dogs does not affect liver-glycogen but inhibits the glycogenolysis due to thyroxine.  
F. O. H.

**Isoelectric point of thyroglobulin.** I. A. SMORODINCEV and A. M. FELDT (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 491—494).—Purified thyroglobulin has an isoelectric point, determined by four different methods, of  $p_H$  4.5. It begins to separate from solution on addition of  $(NH_4)_2SO_4$  at a concn. of 37% of salt and is completely pptd. at 52%.  
W. O. K.

**Dissociation constant of thyroglobulin.** I. A. SMORODINCEV and A. M. FELDT (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 51—53).—1% solutions of thyroglobulin (prepared by the method of Heidelberger and Palmer; A., 1933, 967), containing varying quantities of HCl, were titrated electrometrically. The absorption capacity for  $H^+$  was found to be  $1.05 \times 10^{-3}$  g. per g., and the equiv. 950. The dissociation const. was  $1.78 \times 10^{-3}$ .  
R. C. M.

**Extracts of the pineal gland and secretion of adrenaline.** J. MALMÉJAC and E. DESANTI (Compt. rend. Soc. Biol., 1937, 125, 1077—1078).—Injection of pineal extract causes an increased secretion of adrenaline.  
H. G. R.

**Effect of administration of vitamins on production of defence proteinases.** E. ABDERHALDEN (Fermentforsch., 1937, 15, 264—273; cf. this vol., 37).—In rabbits, parenteral administration of vitamin-A,  $B_1$ , and (in relatively large doses) -C results in appearance of defence proteinases in the urine which act, in varying degrees, on the organs in which hormones are produced.  
W. McC.

**Relation of certain dietary essentials to fertility in sheep.** G. H. HART and R. F. MILLER (J. Agric. Res., 1937, 55, 47—58).—Restriction of sup-

plies of vitamin-A during the breeding season did not affect the no. of lambs produced by adult ewes, previously in good condition, but ewe lambs similarly treated produced lambs which were either born dead or died soon after birth. Low-protein-low-P diet probably affects fertility more seriously than when protein alone is restricted. A. G. P.

**Sources of vitamin-A for chicks. I. Comparison of carotene and vitamin-A as found in cod-liver oil.** R. M. BETHKE and P. R. RECORD (53rd Ann. Rept. Ohio Agric. Exp. Sta. Bull., 1935, No. 548, 73).—The basal requirement of vitamin-A for chicks during the first 8 weeks was met by  $10^{-4}$  g. of carotene (I) per 100 g. of ration. -A supplied as cod-liver oil was as effective as (I) on the same biological rat-unit basis. CH. ABS. (p)

**Relation of vitamin-A to anophthalmos in pigs.** F. HALE (Amer. J. Ophthalmol., 1935, 18, 1087—1093).—Maternal deficiency in vitamin-A resulted in defects (cleft palate or lip, accessory ears, etc.) of the offspring of pigs. CH. ABS. (p)

**Vitamin-A deficiency in the dog.** P. D. CRIMM and D. M. SHORT (Amer. J. Physiol., 1937, 118, 477—482). R. N. C.

**Evaluation of vitamin-A supplements by spectrometric methods.** W. D. McFARLANE and L. RUDOLPH (Sci. Agric., 1936, 16, 398—403).—The spectrographic method probably gives satisfactory results for the better grade of oils. Vals. for low-grade oils may be unduly high. Those for pilchard oils do not agree with results of biological assays. A. G. P.

**Differences in the chromogenic properties of fresh-water and marine fish-liver oils.** A. E. GILLAN, I. M. HEILBRON, E. LEDERER, and V. ROSANOVA (Nature, 1937, 140, 233).—Spectrographic data for liver oils and concentrates from several species of fresh- $H_2O$  fish are recorded. These show an absorption band in  $SbCl_3$  solution at 690—697 m $\mu$ . (or 645 m $\mu$ .), of intensity  $>$  that of the 620 band. In addition, the ultra-violet absorption max. is displaced from the 328 m $\mu$ . of marine liver oils to 345—350 m $\mu$ ., with the frequent appearance of another band at 280—285 m $\mu$ . The 340—350 m $\mu$ . max. appears to be associated with the 693 m $\mu$ .  $SbCl_3$  chromogen. In the liver oils of fresh- $H_2O$  fish the 693 : 620 intensity ratio is approx. 2 : 1, whereas for marine fish it is generally  $<$  0.2 : 1. The 693 m $\mu$ . chromogen may be a second vitamin-A to some extent sp. for fresh- $H_2O$  fish. Accurate determination of the -A content of the liver oils of these fish, by physico-chemical methods, is not yet possible. L. S. T.

**Possible vitamin-A<sub>2</sub>.** J. R. EDISBURY, R. A. MORTON, and G. W. SIMPKINS (Nature, 1937, 140, 234).—In the  $SbCl_3$  test for vitamin-A, an additional band occurs near 693 m $\mu$ . In halibut-liver oils the relative intensities 620 m $\mu$ . : 693 m $\mu$ . are approx. 6 : 1, and in halibut visceral oils 10 : 1. The 693 m $\mu$ . chromogen is rarely detectable in cod-liver oils and never in whale-liver oils. Although frequently absent from the -A fraction of eyes, it has been observed in extracts from goldfish eyes. In brown trout the

693 m $\mu$ . chromogen occurs in the non-saponifiable extracts from livers and viscera, but the 620 m $\mu$ . band has not been detected. Direct absorption spectra showed the presence of three broad bands with max. at 470, 350, and 287 m $\mu$ ., the ultra-violet bands varying in intensity with the 693 m $\mu$ . band in the colour test. In chemical separations with liver oils, the 693 m $\mu$ . chromogen follows -A, the ratio 620 m $\mu$ . : 693 m $\mu$ . remaining approx. const. for a given species. This chromogen with its characteristic ultra-violet absorption is designated "vitamin-A<sub>2</sub>."

L. S. T.

**Quantitative relationships in vitamin-B complex studies.** R. C. BENDER and G. C. SUPPLEE (J. Amer. Chem. Soc., 1937, 59, 1178—1182).—Each of the three factors -B<sub>1</sub>, -B<sub>2</sub>, and -B<sub>6</sub> affects the growth rate of rats to a characteristic extent, which, within limits,  $\propto$  the amount present, but is influenced by the other two factors. A simplified basal ration having sucrose as carbohydrate, and supplemented with two of the factors -B<sub>1</sub>, -B<sub>2</sub>, and -B<sub>6</sub> may be used for the biological assay of the third factor. -B<sub>6</sub> may be assayed comparatively, in the presence of known amounts of -B<sub>1</sub> and -B<sub>2</sub>, by the % incidence of dermatitis. A. LI.

**Utilisation and retention of vitamin-B by young children.** E. M. KNOTT (J. Nutrition, 1936, 12, 597—611).—Retention of vitamin-B increased with the level of ingestion in the range examined. The optimum requirement for young children is approx. 20 units per kg. body-wt. A. G. P.

**Vitamin-B assay using rat curative method with modified diets and oral administration of addenda.** F. P. DANN (J. Nutrition, 1936, 12, 461—468).—Smith's method (U.S. Publ. Health Rep., 1930, 45, 116) gives satisfactory results provided certain details of technique are adhered to. A. G. P.

**Chemistry of vitamin-B<sub>1</sub>.** T. IMAI (J. Biochem. Japan, 1937, 25, 95—107).—A discussion of the constitution of vitamin-B<sub>1</sub> and thiochrome (cf. A., 1936, 1159, 1394; 1937, II, 377). F. O. H.

**Crystalline vitamin-B<sub>1</sub>.** (A) Clinical observations. (B) Observations in diabetes. M. G. VORHAUS, R. R. WILLIAMS, and R. E. WATERMAN (J. Amer. Med. Assoc., 1935, 105, 1580—1583; Amer. J. Digest. Dis. Nutrition, 1935, 2, 541—557).—(A) Curative effects of cryst. -B<sub>1</sub> in a no. of diseases are recorded.

(B) Deficiency of -B<sub>1</sub> disturbs the carbohydrate metabolism, causing an increase in blood-sugar and in the glycogen content of liver and muscle. Possible relationships between -B<sub>1</sub> deficiency and diabetes mellitus are discussed. CH. ABS. (p)

**Destruction of vitamin-B<sub>1</sub> in blood.** P. C. LEONG (Biochem. J., 1937, 31, 1391—1395).—No appreciable destruction of vitamin-B<sub>1</sub> occurs when the aq. hydrochloride at  $p_H$  6.0 is kept at 0° for 3 months, or at 37° for 24 hr. In oxalated blood, fresh or boiled, it is stable at 19° for 24 hr. but appreciably destroyed at 37°. W. O. K.

**Pyrimidine and thiazole intermediates as substitutes for vitamin-B<sub>1</sub>.** W. J. ROBBINS, M. A.

BARTLEY, A. G. HOGAN, and L. R. RICHARDSON (Proc. Nat. Acad. Sci., 1937, 23, 388—389).—Polyneuritis in pigeons may be cured by doses of 5 mg. each of 6-amino-2-methyl-5-bromomethylpyrimidine and 4-methyl-5- $\beta$ -hydroxyethylthiazole given simultaneously. Administration of the compounds separately at a 24-hr. interval has no curative action. Vitamin- $B_1$  is probably synthesised from the two intermediates in the crop or tissues of the pigeon (cf. this vol., 409). A. G. P.

**Crystalline vitamin- $B_1$  from natural sources.** R. D. GREENE and A. BLACK (J. Amer. Chem. Soc., 1937, 59, 1395—1399).—Extract of rice polishings or yeast is shaken with Norit, and then with fuller's earth. The latter is extracted with EtOH- $C_5H_5N$ , HCl, and the extract evaporated, taken up in PrOH (with  $NaHCO_3$ ), and freed from solvents. The aq. solution, saturated with NaCl, is then extracted with PhOH, from which the vitamin is removed by very dil. HCl. The sequence is repeated up to PhOH, and the  $-B_1$  crystallised from PhOH-BuOH and then from EtOH. A. LI.

**Use of a ten-day period for the assay of vitamin- $B_1$  by the rat-growth technique.** F. W. SCHULTZ and E. M. KNOTT (J. Nutrition, 1936, 12, 583—596).—The technique of the method is described. A. G. P.

**Determination of vitamin- $B_1$  in blood by a modification of Schopfer's test.** A. P. MEIKLEJOHN (Biochem. J., 1937, 31, 1441—1451).—The method of Schopfer (A., 1936, 905) for determination of small amounts of vitamin- $B_1$  by means of its growth-promoting activity on *Phycomyces Blakesleeanus* can be used with certain modifications for determination of  $-B_1$  in small amounts (2 c.c.) of blood. The validity of the test is discussed. P. W. C.

**Response of rats, chicks, and turkey poults to crystalline vitamin- $B_2$  (flavin).** S. LEPKOVSKY and T. H. JUKES (J. Nutrition, 1936, 12, 515—526).—Effects of feeding a diet containing the other factors of the vitamin-B complex except  $-B_2$  are recorded. Deficiency of  $-B_2$  in chicks and turkeys lowers the efficiency of food utilisation more conspicuously than it does the appetite. A. G. P.

**Differentiation between vitamin- $B_2$  and an insoluble factor preventing a pellagra-like syndrome in chicks.** I, II. A. T. RINGROSE and L. C. NORRIS (J. Nutrition, 1936, 12, 535—552, 553—569).—I. Dried pig liver contains a factor required to prevent the development of a pellagra-like syndrome in chicks receiving an egg-white diet, and also a factor required for the growth of chicks receiving a purified casein diet. The pellagra-preventing factor differs from the growth factor which is vitamin- $B_2$ . Autoclaving the egg-white at  $p_H$  6.0 or 9.0 (6 hr., 15 lb.) destroyed its ability to cause the pellagra-like syndrome, probably by releasing the preventive factor.

II. Vitamin- $B_2$  contains two factors, one preventing pellagra and one promoting growth. The former occurs in cereals and coagulated egg-white but not in casein. A. G. P.

**Influence of the feed of the cow on the vitamin- $B_2$  content of milk.** C. H. HUNT and A. E. PERKINS (53rd Ann. Rept. Ohio Agric. Exp. Sta. Bull., 1935, No. 548, 74).—Cows receiving a low-protein, low  $-B_2$  ration of timothy hay-beet pulp yielded milk of lower  $-B_2$  potency than those receiving a winter ration of lucerne hay. The  $-B_2$  content of milk from cows at pasture  $\propto$  that of the herbage.

CH. ABS. (p)

**Vitamin- $B_2$  complex.** Differentiation of the antiblacktongue and "P.-P." factors from lactoflavin and vitamin- $B_6$ . VII. Experiments with monkeys and other species. L. J. HARRIS (Biochem. J., 1937, 31, 1414—1421; cf. A., 1936, 254).—Monkeys on a diet containing  $-B_1$ ,  $-B_6$ , and lactoflavin resemble human beings or dogs and differ from rats in that they require the human antipellagra, or canine antiblacktongue, factor. When this is absent, they develop marked loss of appetite, diarrhoea, and vomiting followed rapidly by death without prominent skin lesions. W. O. K.

**Distribution of vitamin- $B_4$  in some plant and animal products.** O. L. KLINE, H. R. BIRD, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1936, 12, 455—460).—Dried grass, peanuts, wheat germ, pork brain, and kidney were good sources of vitamin- $B_4$  for chicks. Cereals were relatively poorer; white maize and hulled oats were superior to yellow maize and wheat. A. G. P.

**Experimental scurvy.** XXXV. Bezssonoff's reacting substance and its identity with vitamin-C. H. TSUGE (J. Biochem. Japan, 1937, 25, 219—236).—The substance reacting with Bezssonoff's reagent (A., 1926, 722) and vitamin-C show identical behaviour with respect to solubility, permeability, adsorption, pptn. by basic Pb acetate, oxidation, and stability to heat, alkalis, or acids. The reactions of the reagent with phenolic substances [*o*- and *p*- $C_6H_4(OH)_2$  and  $-OH \cdot C_6H_4 \cdot OMe$ , but not  $-C_6H_4(OMe)_2$  give positive tests] are discussed. F. O. H.

**Histochemical localisation of vitamin-C in lymphoid organs (tonsils, appendix).** D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1937, 125, 996—998; cf. this vol., 154).—These organs contain considerable quantities of vitamin-C localised in the reticulo-endothelial system. In acute appendicitis, -C of the appendix is reduced by about 30%. H. G. R.

**Vitamin-C deficiency, rheumatic fever, and rheumatoid arthritis.** II. Rheumatoid (atrophic) arthritis. J. F. RINEHART (Ann. Intern. Med., 1936, 9, 671—689).—Chronic vitamin-C deficiency in pigs produces an arthropathy resembling rheumatoid arthritis. CH. ABS. (p)

**Absorption of vitamin-C by the skin.** M. KASAHARA and K. KAWASHIMA (Klin. Woch., 1937, 16, 135—136).—The vitamin-C content of human milk is increased by applying ointment containing -C to the skin of the mammary gland. W. McC.

**Distribution of ascorbic acid in the organism.** A. GIROUD, A. R. RATSIMAMANGA, C. P. LEBLOND, M. RABINOWICZ, and H. DRIEUX (Bull. Soc. Chim. biol., 1937, 19, 1105—1125).—Tables show the

ascorbic acid contents of 59 tissues of ox and horse. The acid is present in practically all tissues and abundant in several endocrine glands, in the activity of which it probably plays a role. P. W. C.

**Seasonal variation in the vitamin-C content of human milk.** M. KASAHARA and K. KAWASHIMA (*Z. Kinderheilk.*, 1936, 58, 191—192).—The vitamin-C content of the milk exhibits individual and seasonal variations, being lowest during Jan.—Feb. and highest in May. The average val. for the milk of Japanese women is 0.0045% and is independent of the age of mother or infant. W. McC.

**Vitamin-C content of colostrum.** M. KASAHARA and K. KAWASHIMA (*Klin. Woch.*, 1936, 15, 1278—1279).—The vitamin-C content of human milk increases on the 3rd day after parturition, remains 2—4 times as great as that of the normal milk for approx. 3 weeks, and then gradually returns to normal vals. In goats the -C content of the milk varies in a similar way, the increase being accompanied by a corresponding decrease in -C content of the aq. humour, probably due to mobilisation of the -C depots of the body. W. McC.

**Vitamin-C content of [cerebrospinal] fluid.** I. Fluid of animals. M. KASAHARA and H. GAMMO. II. Fluid of monkeys suffering from hypovitaminosis-C. M. KASAHARA, M. TATSUMI, and H. GAMMO (*Z. ges. Neurol. Psychiat.*, 1936, 157, 147—148, 149—152).—I. The average vitamin-C contents of the fluid of the rabbit, dog, goat, cat, and monkey are 0.038, 0.066, 0.042, 0.046, 0.023 mg. per c.c., respectively. In all the species there are wide individual variations.

II. The -C content of the fluid of monkeys on a -C-free diet decreases to zero after 3—6 weeks although no scorbutic symptoms are observed. Subsequent subcutaneous injection of large amounts of -C increases the content to  $\times$  twice normal.

W. McC.

**Retinal substances. V. Isolation of vitamin-C from the retina.** O. BRUNNER and W. KLEINAU (*Monatsh.*, 1937, 70, 374—376).—Ascorbic acid was isolated from the retinas of cattle by the method of Hinsberg and Ammon as the 2:4-dinitrophenyl-oxazone of dehydroascorbic acid. The yield (20 mg. from 225 retinas) is 28% of the amount found by titration. A. G.

**Specificity of indophenol in the determination of ascorbic acid in fermented products.** F. W. FOX and W. STONE (*Nature*, 1937, 140, 234).—A reducing substance other than ascorbic acid (I) and having no antiscorbutic activity is formed in large amounts in Kaffir beer, particularly during boiling of the mash and fermentation. At  $p_H > 2.0$ , but not at 1.2—1.8, it behaves as (I) with indophenol (II). (I) oxidase and the Folin uric acid reagent are not sp. for (I). The correct (I) content of this beer corresponds with approx. 0.8 mg. per 100 ml. obtained with the Norit C procedure, and by titration with (II) at  $p_H$  1.2—1.8. L. S. T.

**Enzymic determination of ascorbic acid.** M. SRINIVASAN (*Biochem. J.* 1937, 31, 1524—1529).—The application of ascorbic acid (I) oxidase (cf. this

vol., 29) is described. The reaction is not inhibited by neutralised  $\text{CCl}_3\text{CO}_2\text{H}$ . Some sources of (I) contain impurities [not pptd. by  $\text{Hg}(\text{OAc})_2$ ] which reduce the indophenol reagent but are not enzymically oxidised. F. O. H.

**Determination of vitamin-C saturation.** I. S. WRIGHT, A. LILIENTFELD, and E. MACLEATHEN (*Arch. Int. Med.*, 1937, 60, 264—271).—Following intravenous injection of ascorbic acid approx. 50% is normally excreted in the urine in 24 hr., and 40% in the first 5 hr. H. G. R.

**Vitamin-D studies in cattle. III. Influence of solar ultra-violet radiation on the blood chemistry and mineral metabolism of calves.** C. W. DUNCAN and C. F. HUFFMAN (*J. Dairy Sci.*, 1936, 19, 291—303).—In the development of rickets in calves when -D or ultra-violet radiation is lacking, the decreases of the [Ca] and [P] in the plasma were the first evidences of rickets. Deficiency of radiant energy reduced the ash content of the dry, fat-free rib. Exposure to spring sunshine caused an increase in Ca and inorg. P which persisted in the summer months. W. L. D.

**Prevention of rickets with a cod-liver oil concentrate in milk.** M. G. PETERMAN and E. EPSTEIN (*Amer. J. Dis. Children*, 1935, 50, 1152—1158).—Daily administration of 228 units of vitamin-D as cod-liver oil concentrate in evaporated milk protected infants against rickets in the susceptible period. CH. ABS. (p)

**Vitamin-D content of New Zealand fish-liver oils.** M. M. CUNNINGHAM (*New Zealand J. Sci. Tech.*, 1937, 18, 898—899; cf. A., 1936, 391).—Vitamin-D contents, in international units per g., were as follows: kahawai (*Arripis trutta*), 350; tarakihi (*Dactylopagrus macropterus*), 17; black flounder (*Rhombosolea retiaria*), 1400; snapper (*Pagrosomus auratus*), 57; red cod (*Physiculus bachus*), 3; shark (*Elasmobranchii*), 13. Great variation in -D content may occur within one order. L. D. G.

**Assay of vitamin-D with chickens.** O. N. MASSENGALE and C. E. BILLS (*J. Nutrition*, 1936, 12, 429—446).—The method described is based on the determination of femur ash. A table is given relating the % ash with -D units in terms of cod-liver oil or of irradiated ergosterol (I) together with the probable error. With the diet used, in which Ca:P = 2:1, good calcification resulted from addition of 18 international units of -D as cod-liver oil. The latter and (I) are not generally comparable as sources of -D, their relative efficiency varying with the degree of calcification. A. G. P.

**Relation of vitamin-E to the anterior lobe of the pituitary gland.** M. M. O. BARRIE (*Lancet*, 1937, 233, 251—254).—Pathological changes produced in female rats and their young by deprivation of vitamin-E are described. It is concluded that -E is necessary for the normal function of the anterior lobe of the pituitary. L. S. T.

**Vitamin-P. II.** S. S. ZILVA (*Biochem. J.*, 1937, 31, 1488; cf. this vol., 328).—Details are given of the pre-experimental condition of the animals used

(*loc. cit.*). The negative results then obtained cannot be ascribed to unsatisfactory state of the animals employed. P. W. C.

**Distribution and properties of the anti-gizzard-erosion factor required by chicks.** H. R. BIRD, O. L. KLINE, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1936, 12, 571—582).—The factor is distinct from the anti-hæmorrhagic factor required by chicks. It occurs in pig lung, liver, and kidney, oats, wheat, and maize. Its heat-stability varies somewhat with the source. It is insol. in  $\text{Et}_2\text{O}$  and  $\text{EtOH}$  and accompanies the alkali-sol., acid-precipitable proteins in the fractionation of lung tissue. A. G. P.

**Constitution of plant-cell membranes.** W. STILES (Trans. Faraday Soc., 1937, 33, 923—927).—The wall of a plant cell serves to give rigidity to the plant and is generally completely permeable to  $\text{H}_2\text{O}$  and dissolved substances. The protoplasm as a whole may act as a membrane determining the passage of substances into the central vacuole from an external medium, but it is probable that the limiting layers of the protoplast, forming a thin membrane composed largely of fatty substances but with pores containing an aq. phase, determine the entrance of substances into plant cells. J. W. S.

**Permeability of plant protoplasts to non-electrolytes.** R. COLLANDER (Trans. Faraday Soc., 1937, 33, 985—990; cf. A., 1933, 545).—The permeability of *Chara* and other plant cells to non-electrolytes can be explained on the basis of the "lipin-sieve" theory. It is suggested that the plasma membrane consists of a few layers of regularly oriented lipin mols. J. W. S.

**Electrical evidence on the nature and alterations of membranes in large plant cells.** L. R. BLINKS (Trans. Faraday Soc., 1937, 33, 991—997).—The author's recent work on the electrical resistance and impedance of very large plant cells is summarised. J. W. S.

**Protoplasmic surface in certain plant cells.** W. J. V. OSTERHOUT (Trans. Faraday Soc., 1937, 33, 997—1002).—The surface of the protoplasm of the large multinucleate cells of *Valonia*, *Halicystis*, and *Nitella* behaves as an oily liquid and appears to display a true surface tension. It has a low dielectric const. and resembles guaiacol (I) in its low permeability to ions, the order of penetration of which is  $\text{K}^+ > \text{Na}^+ > \text{Ca}^{++}$ ,  $\text{Mg}^{++}$ , and  $\text{Cl}^- > \text{SO}_4^{--}$ .  $\text{NH}_3$  and guanidine enter the *Valonia* protoplasm by compound formation, whilst  $\text{H}_2\text{S}$  enters by diffusion, so the surface appears to be acid. Certain substances can be removed from the surface (*e.g.*, by  $\text{H}_2\text{O}$ ) without causing disintegration, and the properties are restored when these are returned. The surface layer is probably multimol. Diffusion tests in (I) layers are described which may be parallel to the phenomena in living cells. J. W. S.

**Selective accumulation with reference to ion exchange by the protoplasm.** S. C. BROOKS (Trans. Faraday Soc., 1937, 33, 1002—1006).—The ion exchange theory in which  $\text{H}^+$  is replaced by  $\text{K}^+$  and  $\text{HCO}_3^-$  (or other anion) by  $\text{Cl}^-$  should be modified to include intermediate steps in which  $\text{K}^+$  and  $\text{Cl}^-$

form compounds with some constituent of the protoplasm.  $\text{Rb}^+$ , radioactive  $\text{K}^+$ , and methylene-blue all show evidence of combining with the protoplasm before entering the sap of *Valonia* and *Nitella*. J. W. S.

**Measurement of the oxidising-reducing power of living vegetable tissue.** B. A. RUBIN, N. M. SISAKIAN, and O. T. LUTIKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 495—498).—The reducing power is determined by introducing into the leaf, by the technique of vac. infiltration, aq. ascorbic acid (I) (oxidised by a current of  $\text{O}_2$  in presence of apple juice) and measuring the reduction after 24 hr. The oxidising power is similarly determined by introducing unoxidised (I) by infiltration or by measuring the rate of oxidation of (I) in presence of macerated leaf tissue. W. O. K.

**Availability of plant nutrients.** P. L. HIBBARD (Proc. Soil Sci. Soc. Amer., 1936, 1, 149—151).—The rate at which substances become available is affected by physical, chemical, and biological conditions in the soil, the nature of the plant, and climate. A. M.

**Salt accumulation by plants. Role of growth and metabolism.** F. C. STEWARD (Trans. Faraday Soc., 1937, 33, 1006—1016).—Salt accumulation in plants cannot be considered as a passive property of membranes, since the latter also represent boundary surfaces at which reactions and energy exchanges may occur, and their permeability alone does not suffice for salt accumulation. Salt absorption is classified as "primary" when it involves absorption without loss of ions other than  $\text{H}^+$  and  $\text{HCO}_3^-$ , or as "induced" when it is produced by a change in composition of the external medium. The relationship between growth and salt accumulation cannot yet be attributed to any definite metabolic action. The effects of light,  $\text{O}_2$ , temp., and concn. and  $p_{\text{H}}$  of the medium on salt uptake and the parallelism of the latter with respiration and metabolic activity are discussed. J. W. S.

**Cytological studies of toxicity in meristem cells of roots of *Zea mays*. I. Effects of neutral salts.** J. K. EDWARDS (Amer. J. Bot., 1936, 23, 483—489).—Effects of  $\text{MgCl}_2$ ,  $\text{CaCl}_2$ ,  $\text{KCl}$ , and  $\text{NaCl}$  in various concns. are examined. A. G. P.

**Intake of copper and manganese by wheat from media of different  $p_{\text{H}}$ .** K. BORATYNSKI and H. BURSTROM (Rocz. Nauk. Roln. Les., 1937, 38, 147—170).—With media containing 0.00025—0.0001M-Cu, the Cu intake of wheat increased with rising  $p_{\text{H}}$  in the range 3.5—7.0. The intake of Mn was similarly affected by  $p_{\text{H}}$  but to a smaller extent. The N source ( $\text{NH}_4^+$ ,  $\text{NO}_3^-$ ) did not affect the intake. In the presence of 0.00025M-Cu, K was not absorbed by, but was irregularly eliminated by, the plants. In presence of similar concns. of Mn, K was steadily absorbed in amounts which increased with rising  $p_{\text{H}}$  > 3.8. Cu is stored principally in the meristematic cells at the growing points of the plants. A. G. P.

**Drought-resistance of the soya bean.** H. F. CLEMENTS (Res. Stud. State Coll. Washington, 1937, 5, 1—16).—Soya beans grown with a restricted  $\text{H}_2\text{O}$  supply showed lower growth rates (without change

in external appearance), higher hemicellulose (I) and starch contents (normal sugar), and higher N metabolism than did controls grown under optimum conditions. Drought probably diminishes the translocation of carbohydrates within the plants, but does not affect photosynthesis. The turgid condition of cells of drought-resistant plants may be maintained by the action of (I) in increasing the  $\eta$  of the protoplasm. A. G. P.

**Movement of fluorescein in the plant.** A. RHODES (Proc. Leeds Phil. Soc., 1937, 3, 389—395).—In the conducting tissues of plants fluorescein (I) shows fluorescence only at  $p_H > 5.0$ . Treatment of sections with  $NH_3$  vapour reveals penetration of (I) into the xylem to distances even  $>$  those into phloem. A. G. P.

**Biochemically altered sporopollenins. XII. Membranes of spores and pollen.** F. ZETZSCHE and J. LIECHTI (Brennstoff-Chem., 1937, 18, 280—281; cf. A., 1932, 665, 784).—Examination by the methods previously described of *Lycopodium* spores and the pollen of *Corylus avellana* which had been allowed to putrefy for some months showed that the accompanying biochemical processes had produced marked changes in the sporopollenins. A. B. M.

**Structure of the non-starch-containing beet chloroplast.** E. WEIER (Amer. J. Bot., 1936, 23, 645—652).—The chloroplast consists of a colourless matrix in which are embedded grana associated with chlorophyll (I) and Sudan-staining substances. Willstätter's conception of the colloidal condition may be explained by the association of the (I)-lipin complex with the grana. A. G. P.

**Behaviour of nitrogenous substances during yarovisation of plants.** I. N. KONOVALOV and I. E. ROGALEV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 65—68).—Yarovisation is accompanied by a slight increase in total N content (probably resulting from relative decrease in carbohydrate reserve), a considerable decrease in insol. protein, and a corresponding increase in sol. protein. Non-protein-N, which increases during soaking prior to yarovisation, decreases during yarovisation with the formation of sol. protein, thus indicating a re-synthesis of protein during the process. In untreated seeds germinating at high temp. protein decomp. reaches a more advanced stage than in yarovisation. A. G. P.

**Metabolism of nitrogen; the appearance of allantoinase and urease in the germination of corncockle (*Agrostemma Githago*, L.).** A. BRUNEL and R. ECHEVIN (Compt. rend., 1937, 205, 81—83; cf. this vol., 284).—During germination,  $NH_3$ , amide-N, purine-N, and allantoic acid (which is absent from the seeds) increase, whereas allantoin-N decreases. Allantoinase and urease are present in 21-days-old seedlings, but allantoinase and uricase are not. J. L. D.

**Reduction of nitrous acid to hydroxylamine by higher plants. Role of ascorbic acid.** M. LEMOIGNE, P. MONGUILLON, and R. DESVEAUX (Compt. rend., 1937, 204, 1841—1843; cf. A., 1936, 639).—The press juice of lilac leaves even when boiled

or treated with  $Pb(OAc)_2$  rapidly destroys  $NaNO_2$  or  $p-SO_3H \cdot C_6H_4 \cdot N_2Cl$  at  $p_H$  4.5, and at room temp. 60% disappears immediately.  $NH_2OH$  is formed in varying amounts in these reactions. Ascorbic acid (I) with  $NaNO_2$  in concns. of 0.01N affords  $NO_2$  (cf. A., 1934, 870) but with 0.00625N-(I) and  $<0.001N$ - $NaNO_2$   $NH_2OH$  is formed. J. L. D.

**Amino-nitrogen and reducing sugars of green and chlorophyll-deficient types of maize.** M. G. GRONER (Amer. J. Bot., 1936, 23, 453—461).—The  $NH_2$ -N content of albino seedlings was that of green plants of the same age and stock. Under conditions of carbohydrate starvation,  $NH_2$ -N accumulated both in light and in darkness (probably as a result of decomp. of protein in respiratory processes) and did not increase when sugars were supplied artificially. Feeding glucose or maltose (I) to seedlings deprived of normal carbohydrate supplies by removal of the endosperm inhibited the accumulation of  $NH_2$ -N, (I) being the more effective. The reducing sugar (II) content of seedlings remained substantially const. in all experiments. Certain  $NH_2$ -acids may give rise to (II). The diminution of  $NH_2$ -N during the development of chlorophyll in leaves is ascribed to the protein-sparing action of the photosynthesised carbohydrates. A. G. P.

**Ureides and free urea, degradation products of the purines of *Soja hispida*, Mnch.** R. ECHEVIN and A. BRUNEL (Compt. rend., 1937, 205, 294—296).—Free urea does not exist in the seeds or seedlings of *Soja*. The purine-N of 16-day seedlings germinated in the dark is  $>$  in the light. The seeds contain no purine-N and have no action on allantoic acid (I), but young seedlings contain allantoinase (16-day seedlings contain a trace) which converts (I) into urea and  $CHO \cdot CO_2H$ . The allantoin- and allantoic acid-N content increase as the age of the seedlings increases but there is no free urea because of the presence of urease. Uricase and allantoinase are present in the seeds and seedlings. J. L. D.

**Exudation of glutamine from Chewing's fescue.** B. W. DOAK (New Zealand J. Sci. Tech., 1937, 18, 844).—The white exudate from tops of *Festuca rubra*, var. *fallax*, following application of  $(NH_4)_2SO_4$  contains glutamine. Brown-top (*Agrostis tenuis*) growing in association with the fescue produces no exudate. A. G. P.

**Formation of alkaloids in the plant.** J. GUTSCHMIDT and E. GLET (Apoth.-Ztg., 1937, 52, 33—34).—Alkaloids are considered to be abnormal products of the N metabolism, mainly the protein metabolism, of plants, and to be formed during the period of max. growth; their production parallels that of uric acid during gout, cystine in urine, etc. This explains why alkaloid syntheses in the plant are not quant., why so many alkaloids are formed in one plant, and why alkaloid-free *Conium*, *Papaver*, etc. can be grown by changing the cultural conditions. R. S. C.

**Early and late ripening [of fruit].** R. NUCCORINI [with ZACCAGNINI, F. CERRI, G. DUCCI, U. MARTELLI, and E. BAGNOLI] (Ann. Sperim. agrar., 1935, 17, 41—71; Chem. Zentr., 1936, i, 3763).—

In fruit ripened at relatively low temp. malic is the principal acid; in that ripened at high temp. tartaric and citric acids are also formed. The pentosan, pectin, tannin, N, fat, and ester contents of early-ripened are > those of late-ripened fruit. Constituents which normally diminish in amount during ripening do so more rapidly in early- than in late-ripened fruit, whereas those which normally increase do so more rapidly in late-ripened fruit.

A. G. P.

**Ripening of rowan berries.** R. NUCCORINI [with O. BARTOLI] (Ann. Sperim. agrar., 1935, 17, 73—81; Chem. Zentr., 1936, i, 3763—3764).—The juice of the berries contains glucose, fructose, sucrose, sorbose, and sorbitol. The last is isolated *via* the PhCHO compound after removal of fermentable sugars in the juice by beer yeast.

A. G. P.

**Internal mechanism of photoperiodism.** A. E. MURNEEK (Ann. Rept. Montana Agric. Exp. Sta. Bull. [1933], 1934, No. 340, 63—64).—As short-day soya bean plants approached the reproductive stage accumulation of N in stems, especially at nodes, increased rapidly. All customary forms of N except  $\text{NO}_3^-$  were present, the fractions showing the greatest increase being amide-,  $\text{NH}_2^-$ , and humin-N. In long-day plants little  $\text{NO}_3^-$  occurred in the tips since in the presence of adequate amounts of labile carbohydrate protein synthesis and the development of vegetative organs were rapid. In the reproductive stage N was rapidly translocated to flowers and fruits and carbohydrates, notably starch, accumulated in the stems. The carotene and xanthophyll contents of short-day were > those of long-day plants.

CH. ABS. (p)

**Extrinsic character of oxidations brought about by glucose.** L. PLANTEFOL (Compt. rend., 1937, 204, 1886—1888; cf. this vol., 172).—The rate of respiration of *Hypnum triquetrum* is increased by 75% in 0.1N-glucose. After a brief washing with  $\text{H}_2\text{O}$ , the rate returns to the original val., indicating that the effect occurs outside the cell protoplasm.

J. L. D.

**Explanation of the induction period in the assimilation of carbon dioxide [by plants].** H. GAFFRON (Naturwiss., 1937, 25, 460—461).—It is suggested that the photo-catalyst in plants forms in the dark a dissociable compound with  $\text{O}_2$  which is not photochemically active. This hypothesis explains many of the known facts concerning the induction period which occurs in the process of  $\text{CO}_2$  assimilation when plants are removed from darkness into light.

W. O. K.

**Plant respiration. VII. Aerobic respiration in barley seedlings: relation to growth and carbohydrate supply.** H. R. BARNELL (Proc. Roy. Soc., 1937, B, 123, 321—342; cf. A., 1936, 649).—The respiration rate of whole germinating seedlings is represented by a sigmoid curve with an upper limiting val. at approx. 90 hr., which is maintained until 160 hr. The limiting val. is determined by the amount of carbohydrate translocated from the endosperm. The respiration of isolated embryos declines rapidly from its initial val. to a low starvation level, the reserve of respiratory matter in the embryo

being small. Relations between dry wt. increases and carbohydrate supply are examined.

A. G. P.

**Respiration of barley plants. III. Protein catabolism in starving leaves.** E. W. YEMM (Proc. Roy. Soc., 1937, B, 123, 243—273; cf. A., 1935, 904).—Hydrolysis of proteins in detached starving leaves is continuous and yields, initially, sol. N compounds, probably  $\text{NH}_2$ -acids, glutamine, or peptides. With a decline in carbohydrate (I) concn. further decomp. of N compounds occurs, a stable amide, probably asparagine, being an important product. Extreme depletion of (I) is associated with rapid formation of  $\text{NH}_3$ , which may be a proximate cause of the death of the tissue. The mechanism of these changes is discussed.

A. G. P.

**Dependence of photoperiodic reactions of plants on the spectral composition of light.** V. M. KATUNSKI (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 509—512).—The photoperiodic effect is in the descending order, red, orange, blue, and green light. The magnitude of the effect thus runs parallel with the absorption of the light by the chlorophyll of the leaf.

W. O. K.

**Plant growth-stimulating factors.** G. SOLLAZZO (Boll. Chim. farm., 1937, 76, 368, 371—373).—Caffeine, NaOBz, malachite-green, Congo-red, and, to a smaller extent, methylene-blue stimulate germination; barbiturates have a retarding action on germination and plant growth.

F. O. H.

**Growth of plant embryo *in vitro*. Rôle of accessory substances.** J. BONNER and G. AXTMAN (Proc. Nat. Acad. Sci., 1937, 23, 453—457).—Vitamin- $B_1$ , -C, pantothenic acid, and folliculin promote the growth of pea embryos.

E. M. W.

**Effect of hydrogen-ion concentration on the growth of rootlets of the white lupin. Determination of toxic action on the plant cell.** J. RÉGNIER, R. DAVID, and R. JORIOT (Compt. rend. Soc. Biol., 1937, 125, 1011—1012).—At  $p_{\text{H}} < 3.3$  a retarding action on the differentiation of the various elements of the central cylinder occurs.

H. G. R.

**Thiazole and the growth of excised tomato roots.** W. J. ROBBINS and M. A. BARTLEY (Proc. Nat. Acad. Sci., 1937, 23, 385—388; cf. this vol., 242).—In a synthetic medium for the growth of excised tomato roots, vitamin- $B_1$  may be replaced by 4-methyl-5- $\beta$ -hydroxyethylthiazole with or without 6-amino-2-methyl-5-bromomethylpyrimidine (I) but not by (I) alone (cf. this vol., 405).

A. G. P.

**Zonal growth of the *Avena* coleoptile: effect of artificial growth substance.** R. POHL (Ber. deut. bot. Ges., 1937, 55, 342—354).—The most readily extensible cells of the coleoptile occupy a zone somewhat below the growing tip. These cells are the most sensitive to the action of  $\beta$ -indolylacetic acid. The physiological condition of the cells and probably their age determine their response to growth substance (I). A quantity of (I) which when applied to the tip causes cell extension retards the growth of the active zone when applied to the base of the coleoptile.

A. G. P.

**Influence of several benzene derivatives on the roots of *Lupinus albus*.** M. M. CHRYSOSTOM (Amer. J. Bot., 1936, 23, 461—471).—The order of toxicity of substances examined was, PhOH (I) < resorcinol < cresol (II) < pyrogallol; gallic acid < BzOH < salicylic acid;  $\text{NH}_2\text{Ph}$  <  $\text{NHPhMe}$ . Rise in temp. increased the toxicity of (I), (II), and the amines. Growth of seedlings in solutions of these substances caused an increase in conductance in the case of phenols and amines, a decrease in the case of acids, and a diminution of  $[\text{H}^+]$  in nearly all cases.

A. G. P.

**Activators of peroxidase in diseased plants.** K. SUCHORUKOV and B. STROGONOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 563—565).—*Verticillium*, attacking cotton, produces a substance which stimulates peroxidase activity in diseased plants.

A. G. P.

**Swiss strawberry-seed oil.** J. PRITZKER and R. JUNGKUNZ (Mitt. Lebensm. Hyg., 1937, 28, 12—15).—Two varieties of the dried seeds contained 14.8 and 17.9%, respectively, of oil. The oils had, respectively, butyrefractometer reading at 40° 70.0, 72.0; acid val. 3.7, 10.1; ester val. 184.8, 178.5; sap. val. 188.5, 188.6; I val. 157.7, 165.0; Reichert-Meissl val. 0.66, 0.66; Polenske val. 0.6, 0.6; unsaponifiable matter 1.3, 1.6%; phytosterol < 0.58, 0.56%; solid fatty acids 8.0, 8.6% (Bertram), 5.3, 5.4% (Grossfeld), and isooleic acid 0.7, 0.6%. The respective fatty acids had refraction (40°) 56.2, 57.5; neutralisation val. 194.0, 195.3; mean mol. wt. 289.2, 287.3.

E. C. S.

**Fruit of *Sterculia durida*, F. Muell.** E. CORsINI and R. INDOVINA (Annali Chim. Appl., 1937, 27, 263—269).—The fruit contains 23.7% of seed, of composition:  $\text{H}_2\text{O}$  11.35, ash 3.33, N 1.88,  $\text{P}_2\text{O}_5$  0.92, oil 24.01, cellulose 10.45, starch 15.38, pentosan 8.00, and pectin 1.10% (0.39% sol.). Traces of K, Ca, Al, Mg, Na, Cl,  $\text{PO}_4^{3-}$ ,  $\text{SO}_4^{2-}$ , and  $\text{NO}_3^-$  are present in the ash. The oil has  $d_{25}^{20}$  0.9527, m.p. 10—14°, f.p. 3—8°,  $n_D^{40}$  1.4640, butyrefractometer no. 56—58 at 40°, thermo- $\text{H}_2\text{SO}_4$  no. 60, acid val. 15, sap. val. 209, Ac val. 38, I val. 84—112, Hehner val. 96, Reichert-Meissl val. 0.33, Polenske val. 0.54, unsaponifiable matter 0.69%. The saturated acids consist of 75% of stearic and 25% of palmitic acid.

L. A. O'N.

**Canavanine and canaline.**—See A., II, 402.

**Nitrogenous component of *Sanguinaria canadensis*, L.**—See A., II, 429.

**Sterol ("sapogenol") from Shoyu oil.**—See A., II, 417.

**Constituents of *Lecanora sordida*, Th. Fr.**—See A., II, 398.

**Citraurin from capsanthin.**—See A., II, 384.

**Neo- $\alpha$ -carotene.**—See A., II, 405.

**Sapogenins of *Polygala senega*.**—See A., II, 427.

**Sapogenin of *Gypsophila*.**—See A., II, 427.

**Lævorotatory isomeride of yohimbine in the bark of *Corynanthe pariculata*, Weltnitsch.**—See A., II, 393.

**Alkaloid from the Equisetaceæ family.**—See A., II, 393.

**Alkaloids of *Lupinus laxus*, Rydl.**—See A., II, 434.

**Erythroidine, an alkaloid of curare action, from *Erythrina americana*, Mill.**—See A., III, 434.

**Solanine-s.**—See A., II, 435.

**Titrimetric determination of sugar.** N. FUJII and N. AKUTSU (J. Biochem. Japan, 1937, 25, 237—244).—A modified Benedict's solution is steam-heated in a dish and titrated with the sugar solution.

F. O. H.

**Colorimetric determination of carbohydrate in protein molecule. (Modified Sorensen method.)** K. KONDO and M. MURAYAMA (J. Agric. Chem. Soc. Japan, 1937, 13, 473—493).—Addition of  $\alpha\text{-C}_6\text{H}_4(\text{OH})_2$  to the orcinol- $\text{H}_2\text{SO}_4$  reaction mixture (Sorensen) eliminates effects due to interaction with proteins. Hen ovalbumin contains 2.19% of mannose.

J. N. A.

**Photometric determination of ammonia.**—See A., I, 530.

**Determination of phosphatides.** Y. SUEYOSHI (J. Biochem. Japan, 1937, 25, 151—155).—The tissue is extracted with  $\text{EtOH-Et}_2\text{O}$  and the extract treated with  $\text{EtOH-CdCl}_2$  and conc.; 5% aq. NaCl is added to the resulting emulsion and the ppt. is separated, dissolved in  $\text{EtOH-HCl}$ , and P determined.

F. O. H.

**Polarographic determination of disulphide and thiol in biological substances.** H. G. ROSENTHAL (Mikrochem., 1937, 22, 233—241).—In presence of  $\text{Co}^{++}$  salts as catalyst, SH in protein is oxidised by cathodic loss of  $\text{H}^+$  in ammoniacal solutions at -1.4 and -1.6 volts and that in cysteine at -1.8 volt. S-S groups undergo prior reduction to SH at lower potentials. The method is applicable to biological fluids and hydrolysis products not containing casein, which inhibits the effect.

J. S. A.

**Micro-determination of potassium.**—See A., I, 531

**Micro-determination of chlorides in biological materials.** A. KEYS (J. Biol. Chem., 1937, 119, 389—403).—The method described is based on the Volhard reaction and Laudat's open Carius digestion. 30%  $\text{H}_2\text{O}_2$  is used for digestion in place of  $\text{KMnO}_4$ . 99% recovery of Cl' is effected with plasma or whole blood by 20 min. digestion at 100°. Limiting errors are discussed.

P. G. M.

**Determination of lead in biological material.** M. K. HORWITT and G. R. COWGILL (J. Biol. Chem., 1937, 119, 553—564).—Org. matter is destroyed by ignition (which converts  $\text{Sn}^{II}$  into  $\text{Sn}^{IV}$ ), Pb is extracted with diphenylthiocarbazone (I) in  $\text{CHCl}_3$ , and the (I) of the Pb-(I) complex is determined, after removal of the Pb with dil. HCl, by titration with aq.  $\text{Pb}(\text{NO}_3)_2$ .  $\text{Sn}^{IV}$  does not interfere. Interference by  $\text{Bi}^{+++}$ , Ca, phosphates, and  $\text{Fe}^{+++}$  is prevented by treatment of the ash with aq. KCN, Na citrate, and  $\text{NH}_2\text{OH} + \text{HCl}$ , respectively. Blank determinations must be made. With aq. Pb salts < 0.0002 mg. can be determined but with biological material the error may reach 10%.

W. McC.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

NOVEMBER, 1937.

**Determination of isopropyl alcohol in respiratory air.** E. HAHN (Biochem. Z., 1937, 292, 148—151).—Pr<sup>6</sup>OH is determined (after, e.g., adsorption on SiO<sub>2</sub>) by a modification of the method of Knipping and Ponndorf (A., 1927, 70). An intake of 0.72 g. of Pr<sup>6</sup>OH by man during 1 hr. results in the presence of 8 mg. of COMe<sub>2</sub> in the respired air. F. O. H.

**Arterialisation of blood. VI. Comparison of calculated and experimentally determined decrease in oxygen content of arterial blood during respiratory pause.** H. SARRE and H. WACHTER (Z. Biol., 1937, 98, 221—231; cf. A., 1936, 1399).—A differential equation is deduced to express the temporary fall in [O<sub>2</sub>] of arterial blood during respiratory pause. The difference between curves obtained with this equation and experimental curves is discussed. E. M. W.

**Blood picture of the normal dog.** H. D. BRUNER and G. E. WAKERLIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 667—670).—The following mean vals. were obtained, no difference being observed between the sexes: erythrocytes  $6.45 \pm 0.03 \times 10^6$  per cu. mm., hæmoglobin  $13.56 \pm 0.07$  g. per 100 c.c., reticulocytes  $0.44 \pm 0.014\%$ , leucocytes  $14.18 \pm 0.22 \times 10^3$  per cu. mm. H. G. R.

**Effect of adrenaline on blood count and on hæmatocrit value.** S. P. LUCIA, P. M. AGGELER, G. D. HUSSER, and M. E. LEONARD (Proc. Soc. Exp. Biol. Med., 1937, 36, 582—584).—Injection of adrenaline (I) caused an increase in the erythrocyte and leucocyte counts and in the hæmatocrit val. No significant change was observed on adding (I) to whole blood *in vitro*. H. G. R.

**"Unmodified porphyrin-C."** H. THEORELL (Enzymologia, 1937, 4, Part II, 192—197).—The "unmodified porphyrin-C" of Hill and Keilin (A., 1931, 125) consists of a porphyrin-polypeptide complex of high mol. wt. Removal of the polypeptide by acid hydrolysis leaves a porphyrin of mol. wt. 1020 which contains S, but only traces of NH<sub>2</sub>-N. The absorption spectrum and hydrophily are not affected by the hydrolysis. J. N. A.

**Water-soluble c-hæmin from blood. II. Chromatographic enrichment of c-hæmin and its behaviour when deprived of iron.** O. SCHALES (Ber., 1937, 70, [B], 1874—1880; cf. this vol., 163).—Dil. solutions of hæmoglobin crystals, after peptic digestion, are freed from hæmin by Et<sub>2</sub>O and the aq. phase is evaporated to dryness. The residue is purified by dissolution in H<sub>2</sub>O, admixture with a phosphate buffer, C<sub>5</sub>H<sub>5</sub>N, and Na<sub>2</sub>S<sub>2</sub>O<sub>4</sub>, and

passage through Al<sub>2</sub>O<sub>3</sub> (Brockmann). Hæmin-c (I), thus purified, gives a dull brownish-violet colour in conc. H<sub>2</sub>SO<sub>4</sub>, thus differing from chlorohæmin although the porphyrins thus produced can scarcely be distinguished spectroscopically from one another. Removal of Fe from (I) by HBr-AcOH is accompanied by the appearance of a greenish-brown colour which cannot be driven into Et<sub>2</sub>O-AcOH by addition of NaOAc. (I) cannot therefore be identical with the prosthetic group of cytochrome-c from yeast. H. W.

**Reaction between hæmin and hydrogen peroxide.** F. HAUROWITZ (Enzymologia, 1937, 4, Part II, 139—144).—In solutions containing H<sub>2</sub>O<sub>2</sub> and hæmin (I), three reactions occur, viz., the formation of the H<sub>2</sub>O<sub>2</sub>-(I) complex, the catalytic destruction of H<sub>2</sub>O<sub>2</sub>, and peroxidase destruction of (I). The velocity of the reactions depends on the solvent used. In H<sub>2</sub>O<sub>2</sub>-(I), the H<sub>2</sub>O<sub>2</sub> is co-ordinately linked with the Fe atom. C<sub>5</sub>H<sub>5</sub>N-(I) in presence of physiological H<sub>2</sub> donors is converted by H<sub>2</sub>O<sub>2</sub> into a green Fe-free pigment with an absorption spectrum resembling that of green chlorophyll derivatives. P. W. C.

**Effect of hydrogen peroxide on methæmoglobin.** R. D. BARNARD (Proc. Soc. Exp. Biol. Med., 1937, 36, 762—763).—If methæmoglobin is prepared by oxidation of hæmoglobin with Fe(CN)<sub>6</sub>''' a methæmoglobin peroxide is formed with H<sub>2</sub>O<sub>2</sub> (cf. Keilin and Hartree, A., 1935, 372), whereas if quinhydrone is used oxyhæmoglobin is produced. H. G. R.

**Reactions of nitrite with hæmoglobin derivatives.** R. D. BARNARD (J. Biol. Chem., 1937, 120, 177—191).—NO<sub>2</sub>' combines with the nucleus Fe of methæmoglobin (I) and diminishes its oxidising activity. Combination of NO<sub>2</sub>' with (I) or with hæmatin (II) yields similar products. In aq. NH<sub>3</sub>, (II) yields a dissociable compound with NO<sub>2</sub>'. In AcOH-Et<sub>2</sub>O, (II) is reduced by NO<sub>2</sub>' to a hæmochromogen-like compound. NO<sub>2</sub>' reacts with, and denatures, the globin of hæmoglobin derivatives. J. L. C.

**Determination of albumin and globulin in serum. I. Errors involved in the filtration procedure.** H. W. ROBINSON, J. W. PRICE, and C. G. HOGDEN (J. Biol. Chem., 1937, 120, 481—498).—Following pptn. of globulin by addition of Na<sub>2</sub>SO<sub>4</sub> (Howe, A., 1922, ii, 172), filtration through paper results in a significant adsorption loss of albumin (I) to an extent independent of (I) concn. but dependent on the type and quantity of paper. Refiltration of the filtrate through the same paper finally produces

saturation with (I). The adsorbed (I) is not eluted by 22% aq.  $\text{Na}_2\text{SO}_4$ . A modified procedure to avoid this source of error is described. F. O. H.

**Presence of a new serum-protein in the blood of various animals.** L. F. HEWITT (Biochem. J., 1937, 31, 1534—1537).—Glycoprotein fractions resembling seroglycoid from horse's serum (cf. A., 1937, 164) were obtained from fox, rabbit, human, and chicken sera. The fractions contained considerable amounts of carbohydrate, were not coagulated by heat or pptd. by  $\text{CCl}_3\cdot\text{CO}_2\text{H}$ , and had  $[\alpha] < \text{that of crystalbumin}$ . J. L. C.

**Measurement of depolarisation of Tyndall light with solutions of proteins, particularly fibrinogen.** E. WOHLISCH and A. NEUGSCHWENDER (Biochem. Z., 1937, 292, 196—211).—Measurements of intensity and degree of depolarisation of Tyndall light during the coagulation of aq. fibrinogen (I) by thrombin show that with low (I) concn. (at which a negative phase of depolarisation occurs), total depolarisation decreases with increasing concn., whilst above a certain val. of (I) concn. it is independent of concn. The relationship between the angle of depolarisation and opalescence of the solution and the bearing of the data on coagulation phenomena with reference to both colloidal systems and (I) are discussed. F. O. H.

**Adsorption of polypeptides by blood-plasma proteins.** J. LOISELEUR and R. COLLIARD (Compt. rend., 1937, 205, 261—263; cf. this vol., 374).—After eliminating proteins by  $\text{CCl}_3\cdot\text{CO}_2\text{H}$  (I), the filterable N (II) of dil. plasma increases with increasing dilution but not to the same extent as does the (II) from a peptone solution, probably because of the difference in the nature of the colloidal particles. Plasma treated with  $\text{MgSO}_4$  (1 vol.) for a given time and at a definite temp. and then with (I) (2 vols.) affords more (II) than in the absence of  $\text{MgSO}_4$ ; as the  $[\text{MgSO}_4]$  increases, (II) increases to a max., which inversely  $\propto$  the temp. and the time of contact of  $\text{MgSO}_4$  with the plasma, and then decreases. J. L. D.

**Determination of blood-creatinine by the Lange-Roth photometer.** P. VON VÉGH (Biochem. Z., 1937, 292, 189—190).—The method, based on the photometric determination of extinction coeffs. of the colour produced by alkaline picric acid in blood (3 c.c.) deproteinised by  $\text{Na}_2\text{WO}_4\text{--H}_2\text{SO}_4$ , is described. F. O. H.

**Determination of creatinine in blood.** H. POPPER, E. MANDEL, and H. MAYER (Biochem. Z., 1937, 291, 354—367).—A modification of the method of Folin (A., 1914, ii, 505) is described. A step-photometer or, better, an abs. colorimeter is used. The creatinine (I) content of healthy human whole blood, plasma, and serum is 0.5—1.0 mg. per 100 c.c. The val. remains const. in the individual and is not affected by bleeding, by consuming large amounts of meat or  $\text{H}_2\text{O}$ , or by giving  $\text{NH}_2$ -acids or diuretics. The (I) content of cerebrospinal fluid, pleural exudates, or ascites is of the same order as that of blood. W. McC.

**Cystine in normal and cystinuric human blood.** B. H. BROWN and H. B. LEWIS (Proc. Soc.

Exp. Biol. Med., 1937, 36, 487—488).—The plasma ultrafiltrate of normal human blood contains approx. 1.0 mg. of cystine (I) per 100 c.c. No increase of (I) occurs even after feeding methionine to a cystinuric patient. P. G. M.

**Glucosamine content of the serum in health and in pneumonia.** I. NILSSON (Biochem. Z., 1937, 291, 254—258).—The glucosamine (I) content of the serum-proteins (II) is increased in pneumonia whilst the serum-mucoid is unchanged. Comparative data for the (I) content in the normal (II) of horse, cow, pig, and rabbit are given. W. McC.

**Effect of bile with and without cholesteryl esters on esterification of cholesterol in plasma.** C. RIEGEL, I. S. RAVDIN, and H. J. ROSE (J. Biol. Chem., 1937, 120, 517—530).—Heating of plasma to 38° with normal hepatic bile (dog, man) causes hydrolysis of cholesteryl esters (I) whilst heating plasma alone produces esterification. The hydrolysis does not occur when the bile contains (I), the content of which is unaffected by heating to 38° with normal bile. F. O. H.

**Blood fats during the dietary production of fatty livers in dogs.** E. V. FLOCK and J. L. BOLLMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 853—855).—No increase in the neutral fats of the plasma was observed on a high-fat diet with or without EtOH. H. G. R.

**Precipitin tests with glycogen from various species of animals.** D. H. CAMPBELL (Proc. Soc. Exp. Biol. Med., 1937, 36, 511—512).—Rabbit antisera do not react with liver-glycogen (I) from guinea-pigs, frogs, and chickens, whilst (I) from clams and helminths is immunologically active and sp. P. G. M.

**Glycolysis in blood. III. Glycolysis and glutathione.** S. MORGULIS [with B. WAGNER] (Biochimia, 1937, 2, 638—656).—The level of reduced glutathione (I) remains const. in rabbit blood during glycolysis, after completion of which oxidation of (I) commences. In dog's blood oxidation of (I) commences shortly before completion of glycolysis. Oxidation of (I) is accelerated by adding substances which inhibit glycolysis ( $\text{NaF}$ ), but is not affected by  $\text{NaCN}$ , which stimulates glycolysis. R. T.

**Sugar content of heparinised and oxalated plasmas.** I. NEUWIRTH (J. Biol. Chem., 1937, 120, 463—465).—The permeability of blood cells (rabbit, man) for sugar is confirmed. J. N. A.

**Quantitative drop analysis. IX. Determination of blood-glucose.** K. HECK, W. H. BROWN, and P. L. KIRK (Mikrochem., 1937, 22, 306—314).—A solution containing  $1\text{--}12 \times 10^{-8}$  g. of glucose is treated with 0.04 ml. of 14%  $\text{Na}_2\text{CO}_3$  + 0.04 ml. of 1.5%  $\text{K}_3\text{Fe}(\text{CN})_6$  at 100° for 5 min. The liquid is acidified with 10%  $\text{H}_2\text{SO}_4$ , and the  $\text{Fe}(\text{CN})_6^{4-}$  so formed is titrated with 0.01N- $\text{Ce}(\text{SO}_4)_2$ , using  $\text{FeSO}_4$ -phenanthroline as indicator (A., 1931, 1385). Biological fluids are deproteinised with  $\text{CuSO}_4$  +  $\text{Na}_2\text{WO}_4$ ; the solution is separated centrifugally, and treated as above. J. S. A.

**Effect of dosage on the rate of disappearance of alcohol from the blood stream.** H. W. NEW-

MAN, A. J. LEHMAN, and W. C. CUTTING (J. Pharm. Exp. Ther., 1937, **61**, 58—61).—After a single intravenous injection of EtOH into dogs, the fall in concn. of blood-EtOH  $\propto$  the time, the rate increasing by approx. 17% each time the dose is doubled between 1 and 6 c.c. per kg.

H. G. R.

Empirical regression equation relating total serum-calcium to serum-albumin and -globulins. A. B. GUTMAN and E. B. GUTMAN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 527—531).—Total serum-Ca is composed of  $\leq 4$  fractions, which are represented by the regression equation, total Ca =  $\times$  albumin +  $m_2 \times$  globulin II +  $m_3 \times$  globulin I +  $b$ . The variation of the consts. is discussed in the light of the results obtained.

P. G. M.

Calcium : magnesium ratio in serum. M. JACOBY and R. JAKOBOWITZ (Enzymologia, 1937, **3**, Part I, 1—4; cf. A., 1933, 746).—The min. lethal doses of  $H_2C_2O_4$ ,  $Ca^{++}$ , and  $Mg^{++}$  for mice (wt. approx. 15 g.) are 2, 1.6, and 2.4 mg., respectively. The effect of  $H_2C_2O_4$  is counteracted by injecting sublethal doses of  $CaCl_2$  but is reinforced by injecting non-lethal doses of  $MgCl_2$  which, however, counteract the effect of lethal doses of  $CaCl_2$ . In rabbits, injection of  $MgCl_2$  produces an increase in blood-Mg and a parallel but less pronounced decrease in  $-Ca^{++}$ , the Ca : Mg ratio being reduced. Injections of  $CaCl_2$  increase serum- $Ca^{++}$  and decrease  $-Mg^{++}$ , the Ca : Mg ratio being increased, usually greatly.

W. McC.

Determination of serum-inorganic phosphate and serum-phosphatase activity. A. BODANSKY (J. Biol. Chem., 1937, **120**, 167—175).—Modifications of previously-described methods are given (A., 1933, 316, 863).

J. L. C.

Photometric determination of blood-potassium. A. HEIDUSCHKA and H. OBER (Biochem. Z., 1937, **292**, 191—195).—Blood (7—8 c.c.) is deproteinised by  $CCl_3 \cdot CO_2H$  and ashed in presence of  $HClO_4$ . The ash is dissolved in aq.  $HClO_4$  and treated with  $H_2PtCl_6$ . The pptd.  $K_2PtCl_6$  is separated, treated with  $KI-H_2SO_4$ , and extinction coeffs. of the red-coloured aq.  $K_3PtI_6$  are measured photometrically.

F. O. H.

Distribution of iron in the blood. C. E. JENKINS and M. L. THOMSON (Brit. J. Exp. Path., 1937, **18**, 175—190).—A colorimetric method of determining Fe by the thioglycollic acid method is described. The necessity for exactness in minutiae of technique is emphasised.  $Fe(NH_4)_2(SO_4)_2$  is used for the standard. The red corpuscle contains approx. 7% more Fe than can be accounted for as haemoglobin (I). Vals. are given for normal and various anaemic conditions and support the suggestion that this non-haemoglobin-Fe results from breakdown of (I) during ageing of the cell. Confirmatory indications are given by its variation during the menstrual cycle. Plasma-Fe shows a wide range of variation which is partly related to special conditions.

R. M. M. O.

Convenient method of securing blood for [micro-]analysis. E. M. ABRAHAMSON (Science, 1937, **86**, 202).

L. S. T.

z\* (A., III.)

Clot prevention in blood studies in animals. S. NITRIS (Science, 1937, **86**, 201—202).—A simple technique using Na citrate is described.

L. S. T.

Mechanism of the activation by chloroform of thrombin in plasma and serum. I. Action of chloroform on oxalated plasma. II. Action of chloroform on serum. H. SCHEURING (Biochem. Z., 1937, **291**, 385—398; **292**, 1—15; cf. A., 1935, 1263).—I.  $CHCl_3$  ppts. fibrinogen (I), at the same time dehydrating it, neutralising its electric charge, damaging its micellar structure, and so first diminishing and then destroying its power to coagulate. The coagulating effect of added thrombin (II) is counteracted by  $CHCl_3$  before that of added  $Ca^{++}$ . Hence (I) when pptd. carries down (II), which exerts its coagulating power only after combining with (I).  $CHCl_3$  slowly removes (II) from (I) and prevents recombination of (I) and (II). Accordingly the (II) content of plasma is increased by addition of  $CHCl_3$ .

II. Serum contains a protein which absorbs and hence inactivates the (II) present in lower concn. than in plasma where (II) is bound to (I). (I) and antithrombin (III) have similar physico-chemical structure and hence are affected in the same way by (II) and by  $CHCl_3$  and differ only in their power to produce fibrin. The difference in the rate at which (II) of serum and plasma are activated by  $CHCl_3$  is due to the presence or absence of (I). In serum thrombogen (IV) is adsorbed on (III) on the surface of which (II) production occurs when thrombokinase (V) is added.  $CHCl_3$  removes adsorbed (IV) from (III) and retards (II) production after addition of (V).  $CHCl_3$  damages the lipoid envelope of erythrocytes, thus diminishing their power to adsorb (V) and to regulate coagulation.

W. McC.

Effect of trypsin on the clotting of blood in haemophilia. T. L. TYSON and R. WEST (Proc. Soc. Exp. Biol. Med., 1937, **36**, 494—496).—Like thrombin, trypsin (I) accelerates the *in vitro* coagulation of haemophilic blood. Daily oral administration of 30 g. of (I) with  $CaCO_3$ , on an empty stomach, to two cases of haemophilia did not affect the clotting time of the blood.

P. G. M.

Use of dialysis in the preparation and purification of immunologically active bacterial products. S. MORELL and G. SHWARTZMAN (Science, 1936, **86**, 130).

L. S. T.

Relationship between antibody reaction and enzyme action. H. SACHS (Enzymologia, 1937, **3**, Part I, 44—51).—A review.

W. McC.

Is antibody-globulin "denatured" by its combination with antigen? S. B. HOOKER and E. M. FOLLENSBY (Proc. Soc. Exp. Biol. Med., 1937, **36**, 834—835).—The cohesive property of specifically combined antibody-globulin is not developed by heat-denatured normal globulin.

H. G. R.

Action of formaldehyde on antibodies. K. IVANOV (Z. Hyg., 1936, **118**, 197—203).—Addition of  $CH_2O$  to immune sera is injurious to antibodies to an extent which is related to the  $[CH_2O]$  and the time of action. Precipitins, e.g., of anthrax and the antibodies of sera for fowl cholera and swine fever are

very sensitive. Agglutinins and hæmolysins are less easily affected and antigens suffer no injury.

A. G. P.

**$\beta$ -Specific receptors (homogeneous coagglutinins) in bacteria of the hog-cholera group.** F. OHASHI (Z. Immunitats., 1937, 90, 118—124).—The three existing forms of the hog-cholera group can be distinguished by means of their  $\beta$ -sp. receptors.

C. R. S.

**Analysis of protective substances in specific sera which control experimental infection with *Cl. oedematis maligni* (*Vibrio septique*).** D. W. HENDERSON (Brit. J. Exp. Path., 1937, 18, 224—238).—The H antibody produced in response to this organism has a protective val. although its action is purely to immobilise the organism and no sensitisation can be demonstrated *in vitro*. An explanation of the protective val. of immobilisation in the case of invasion of tissues by an anaerobe is given. An antibacterial serum forms the most potent protection against this organism.

R. M. M. O.

**Decrease of toxicity of diphtheria toxin by lanoline and sterols; influence of cholesterol on its immunising power.** M. EISLER and F. GOTTDENKER (Z. Immunitats., 1937, 90, 427—451).—The toxicity of diphtheria toxin is reduced (in a degree which increases with the time of incubation) by mixing with lanoline, olive oil, cholesterol (I), its esters, phytosterol, or oxycholesterol. (I) is less effective in aq. suspension than as aq. sol or in solution in oil. An aq. extract of a light petroleum solution of the toxin with lanoline or (I) after sufficient incubation is no longer toxic. The toxin is not destroyed within the animal. The quantity of antitoxin formed increases when (I) is injected with the toxin.

C. R. S.

**Diphtheria toxin production. III. A simple gelatin hydrolysate medium and some properties of the toxin produced thereon.** A. M. PAPPENHEIMER, jun., and S. J. JOHNSON (Brit. J. Exp. Path., 1937, 18, 239—244).—A protein-free medium is described on which toxin is produced in large amounts and from which it can subsequently be separated by pptn. with  $(\text{NH}_4)_2\text{SO}_4$ . The toxin behaves as a protein and is very sensitive to denaturation on the acid side of  $p_H$  6. Though Fe inhibits its production, continued culture on an Fe-containing medium does not affect the toxin production when the organisms are then transferred to Fe-free medium. A non-toxic protein is formed which ppts. at 1/3 saturation with  $(\text{NH}_4)_2\text{SO}_4$  both in the presence and absence of Fe. The toxin is pptd. almost completely at 2/3 saturation.

R. M. M. O.

**Effect of a heat-resistant enzyme on the antigenicity of pneumococci.** R. J. DUBOS and C. M. MACLEOD (Proc. Soc. Exp. Biol. Med., 1937, 36, 696—697).—A heat-resistant enzyme, which renders heat-killed pneumococci Gram-negative without dissolution and inactivates the capsular antigen, has been obtained from various tissues.

H. G. R.

**Antigen content of filtrates of cultures of *Staphylococcus aureus*.** (Analysis by the Schultz-Dale method.) F. SCHAAF and P. ROBERT (Z. Immunitats., 1937, 90, 192—206).—Repeated

injections of the untreated filtrates or those modified by heat or treatment with  $\text{CH}_2\text{O}$  caused anaphylaxis and contraction of the uterus of sensitised guinea-pigs. All three filtrates contained a common antigen and one or more of four characteristic antigenic groups.

C. R. S.

**Evaluation and mode of action of tetanus toxin.** K. HALTER (Z. Hyg., 1936, 118, 245—262).—The higher titre obtained when the toxin is diluted with aq. peptone (I) than when  $\text{H}_2\text{O}$  or aq. NaCl is used is attributed to the relatively greater lability of the toxin in NaCl rather than to activation by (I). Inactivation by NaCl is largely though not entirely dependent on the amount of  $\text{O}_2$  dissolved in the solution. Peptone forms compounds with the  $\text{O}_2$ , thus protecting the toxin.

A. G. P.

**Effect of cysteine on tetanus toxin.** P. B. COWLES (Yale J. Biol. Med., 1936, 8, 265—268).—In  $\text{O}_2$ , cysteine (I) can detoxicate tetanus toxin yielding a toxoid which stimulates the production of and unites with antitoxin. The reaction differs from that of (I) with Cu.

CH. ABS. (p)

**Immunising power of varieties of tubercle bacilli.** J. WEISSFEILER, E. N. MOROSOVA, and E. J. PESINA (Ann. Inst. Pasteur, 1937, 59, 259—281).—Of various avirulent strains, the immunising power is greatest with BCG strains and slight in chromogenic and saprophytic types. Injection of the dried bacilli (0.1 mg.) significantly immunises guinea-pigs for 4—6 months. The degree of immunisation afforded does not depend on the presence of living bacilli in the organism.

F. O. H.

**Differences in thermostability of various groups of antibodies.** K. MEYER and A. PIC (Ann. Inst. Pasteur, 1937, 59, 282—292; cf. this vol., 55).—The anti-lipin and -polysaccharide antibodies of tubercular serum are inactivated at different temp., the former being more thermostable for rabbit, horse, and man and the latter for guinea-pig. The stability (which is independent of the medium) differs with antibodies of the same type from different sera of the same animal species.

F. O. H.

**Antigenic nature of the polysaccharides of tubercle bacillus.** F. KLOSTOCK and A. VERCELLONE (Z. Immunitats., 1937, 90, 507—512).—Polysaccharides isolated from the bacilli and carefully freed from any traces of lipins showed no sp. biological reaction.

C. R. S.

**Sensitivity of different strains of typhoid bacilli to the bactericidal action of natural and immune sera.** Y. B. ABDOSH (Z. Immunitats., 1937, 90, 125—138).—The natural bactericidal antibodies of different mammals behave differently towards the three groups of *Bact. typhosum*. Some show marked differences, others no distinction, between virulent and avirulent strains. Rough strains show bactericidal action more than smooth strains with or without vi-antigen. The O-antibody is markedly, the H-antibody weakly, bactericidal to various strains of *Bact. typhosum*. The vi-antibody is also active towards strains with the corresponding antigen.

C. R. S.

**Chemical nature of *O*-antigens of *Bact. typhosum*.** Y. AOKI, K. OBI, and H. TANAKA (Z. Immunitats., 1937, 90, 162—173).—The nucleoprotein fraction of typhoid bacilli contains the sp. and the non-sp. heterologous *O*-agglutinins; the polysaccharide fraction contains the homologous non-sp. *O*-agglutinin. The fat fraction has no agglutinin-forming power.  
C. R. S.

**Resistance of different receptors to disinfectants.** K. AOKI (Z. Immunitats., 1937, 90, 452—458).—Typhoid bacilli of mice were subjected to heat and to treatment with antiformin, PhOH, CH<sub>2</sub>O, EtOH, HgCl<sub>2</sub>, Lugol's solution, KOH, peppermint oil, H<sub>3</sub>BO<sub>3</sub>, alum, and supersaturated solutions of NaCl. The  $\beta$ -sp. receptors being the most sensitive are destroyed at the same time as the living bacteria; the  $\beta$ -non-sp. receptors are the least sensitive.  
C. R. S.

**Demonstration of vaccinia virus in the organs of vaccinated rabbits.** O. ANDERSEN (Z. Immunitats., 1937, 90, 105—117).  
C. R. S.

**Electric impedance of marine eggs.** K. S. COLE and R. H. COLE (Physical Rev., 1936, [ii], 49, 645).—Calculations based on measurements of the a.c. resistance and capacity of sea-H<sub>2</sub>O suspensions of the eggs of sea-urchins and the common starfish show that (i) the capacity of the unfertilised egg interior varies from 0.75 to 1.1  $\mu$ F. per cm.<sup>2</sup>, (ii) the egg interior is not electrically homogeneous, approx. 5% of the vol. being membrane-covered material, whilst the balance has a sp. resistance 6—8 times that of sea-H<sub>2</sub>O, and (iii) on fertilisation, a membrane with a capacity 2—3  $\mu$ F. per cm.<sup>2</sup> is laid down over the egg surface, and separated from it by a space, a few  $\mu$ . thick, which has approx. the sp. resistance of sea-H<sub>2</sub>O.  
L. S. T.

**Changes of hydrogen-ion concentration of the cerebral cortex.** J. G. D. DE BARENNE, W. S. McCULLOUGH, and L. F. NIMS (Proc. Soc. Exp. Biol. Med., 1937, 36, 462—464).—The  $p_H$  of the cerebral cortex  $\propto$  its spontaneous electrical activity. Heat-coagulation (5 sec. at 80°) of an area renders this area acid ( $p_H$  6.6) relative to the adjacent normal cortex ( $p_H$  7.3).  
P. G. M.

**Chemical activity of nerve-trunks.** Q. CALABRO (Riv. Biol., 1937, 22, 127—131).—Mainly polemical against Bergami (cf. this vol., 258).  
F. O. H.

**Distribution of potassium in nature.**—See A., I, 585.

**Cattle bones. General composition and protein-nitrogen distribution of pig's bones.** M. SAITO (Rep. Inst. Sci. Res. Manchoukuo, 1937, 1, 19—22).—Various bones of a pig were analysed in respect of H<sub>2</sub>O, fat, ash, Ca, P, and total protein (I). The yield of crude gelatin (II) extractable by hot H<sub>2</sub>O is 25—53% of (I). The N distribution of the NH<sub>2</sub>-acids from (I) resembles that of (II), but (I) contains small amounts of tyrosine, tryptophan, and cystine.  
W. O. K.

**Sodium content of bone and other calcified material.** H. E. HARRISON (J. Biol. Chem., 1937, 120, 457—462).—The Na content of bone is that

accounted for by extracellular fluid (A., 1936, 682). With bones of rats with various disorders of calcification, the "excess Na," except in those cases where large doses of irradiated ergosterol are given,  $\propto$  Ca content (Ca : Na = 30 : 1). The excess Na cannot be extracted by digestion with KOH-EtOH. Tooth enamel and two samples of pathologically calcified tissue contained approx. the same Na : Ca ratio as in bone. Probably the Na in such material is part of an apatite complex, similar to the Na in fluorapatite.  
J. N. A.

**Component acids of ox depôt fat. Minor constituents.** T. P. HILDITCH and H. E. LONGENECKER (Biochem. J., 1937, 31, 1805—1819).—Acids hitherto unreported from depôts of the type studied include  $\Delta^8$ -tetradecenoic and -hexadecenoic acid, both present only in small quantity although known as normal components of the depôt fats of lower forms. The C<sub>18</sub> fraction showed a higher I val. than could be accounted for by oleic acid and contained  $\Delta^8$ -octadecenoic and  $\Delta^9$ -octadecadienoic acids. The identification of the dienoic acid was complicated by the low yields (in comparison with the unsaturation to be accounted for) in which tetrahydroxystearic acids were obtained, in contrast to that from the linoleic acid of seed fats. The octadecadienoic acid of ox depôt fat resembles rather that of cow milk fat. Traces of saturated and unsaturated C<sub>20</sub> acids were regularly observed, but arachidic acid could be isolated only after hydrogenation. Of major components, palmitic acid (26—31 mol.-%) and total C<sub>18</sub> acids (61—65%) have about the normal vals. for ox and sheep depôt fats. Allowing for the small quantities of hitherto undetected acids now revealed, earlier analyses (Banks and Hilditch, A., 1931, 1178) agree closely with the present figures, implying that total C<sub>18</sub> val. is approx. const., occasional variations in stearic and oleic acids being mutually balanced. The previously established relation between molar % of fully saturated glycerides and molar % of saturated acids in whole fat is confirmed.  
R. M. M. O.

**Fatty acids of egg oil.** F. TROST and B. DORO (Annali Chim. Appl., 1937, 27, 233—242; cf. B., 1933, 476; A., 1934, 920).—Fatty acids in the oil consist of oleic 35, palmitic 29, palmitoleic 12, linoleic 10, stearic 9, myristic 2, and arachidic acid 0.07%.  
E. W. W.

**Analysis of "angel"-fish eggs.** J. DE D. GUEVARA (Bol. Soc. Quim. Peru, 1937, 3, 78—89).—A prep. of the roe of *Squalus angelus* (H<sub>2</sub>O 16.91, ash 2.4, org. N 10.93, total N 11.41, P 1.92, cholesterol 5.44, lecithin 2.05%) yielded 11.33% of CHCl<sub>3</sub>-sol. fats,  $n$  1.4825—1.4880, I val. 105—130, and contained vitamin-A and -D.  
F. R. G.

**Radial inclusions of giant cells.** E. F. HIRSCH (Arch. Path., 1935, 20, 665—682).—The inclusions are cryst. fats (palmitin, stearin) which separate from an oil system containing cholesterol or similar substances and appear when the liquid portion is removed more quickly than the combustion of the dissolved fat occurs. Chemical changes may occur in the composition of the crystals in the tissues rendering them insol. in fat solvents.  
CH. ABS. (p)

**Absorption of fats and dialysis of fatty acids.**—See A., I, 562.

**Non-labile deuterium of amino-acids treated in dilute deuterium oxide media.**—See A., II, 448.

**Nitrogenous constituents of the muscle of the shark, *Acanthias vulgaris*.** M. MOHR (Z. Biol., 1937, 98, 276—280; cf. this vol., 167).—Arginine, creatine, and creatinine were isolated. The significance of this is discussed. E. M. W.

**Newer biological aspects of protein chemistry.** M. BERGMANN and C. NIEMANN (Science, 1937, 86, 187—190).—A review. L. S. T.

**Neuroproteins. II. Effect of age on amino-acid composition of human and mammalian brain proteins.** R. J. BLOCK (J. Biol. Chem., 1937, 120, 467—470; cf. this vol., 374).—Proteins prepared from the brains of five normal human males, aged 4 to 82 years, were analysed for N, histidine (I), lysine (II), arginine (III), tyrosine, and tryptophan. The mol. ratio of (II):(III) was approx. const. Neuroproteins from rat, guinea-pig, monkey, sheep, and ox yielded approx. the same amounts of the five  $\text{NH}_2$ -acids. The amount of (I) in the proteins from young mammals is < that from adults. J. N. A.

**Constitution of myosin and myogen.** J. G. SHARP (Rep. Food Invest. Bd., 1936, 20—21).—The Hausmann nos. of myosin and myogen from rabbit's muscle are recorded. The proteins contain, respectively, arginine 12.80, 11.45%, histidine 2.74, 4.68%, and lysine 10.90, 8.88%. E. C. S.

**Proteins of fish.** G. A. REAY and C. C. KUCHEL (Rep. Food Invest. Bd., 1936, 93—94).—The intracellular proteins (I) (96%) are separated from the stroma-proteins (4%) by exhaustive extraction with 0.05—0.005N-HCl or 0.1—0.005N-NaOH. 7% aq. LiCl removes approx. 85% of the total protein, the remaining (I) becoming sol. after autoclaving and therefore not separable from collagen. The aq. LiCl extract is fractionated by dilution with  $\text{H}_2\text{O}$  into "myosin" and "myogen," the contents of which in freshly-caught and frozen haddock's muscle are recorded. As a result of freezing and storage at  $-3^\circ$  for 8 months the sol. (I) are reduced from 85 to 27% of the total protein. E. C. S.

**Separation and characterisation of the proteins of egg-white.** E. G. YOUNG (J. Biol. Chem., 1937, 120, 1—9).—Protein fractions were separated from hen's egg-white by  $(\text{NH}_4)_2\text{SO}_4$  pptn. and by dilution with  $\text{H}_2\text{O}$ . In addition to ovalbumin and ovomucoid [cystine (I) 3.95%, ovomucin [N 12.5, S 1.73, (I) 4.57, glucosamine (II) 11.0%] was isolated by both procedures but no globulin was found. These fractions are probably degradation products of a single complex existing in the natural material. The chalaza protein is a mucoprotein [N 13.3, S 1.08, (I) 4.10, (II) 11.4%]. R. M. M. O.

**Degradation of ovalbumin by heating with  $\beta$ -naphthol.** Chemistry and enzymic behaviour of the degradation products. A. FODOR and N. LICHTENSTEIN (Enzymologia, 1937, 4, Part II, 36—39; cf. this vol., 141).—Denatured ovalbumin (I)

with  $\beta\text{-C}_{10}\text{H}_7\cdot\text{OH}$  ( $135\text{--}150^\circ$ ; 6 hr.) yields four fractions, the chief of which, constituting 50% of the amount of (I) taken, is a substance, possibly  $\text{C}_{116}\text{H}_{174}\text{O}_{36}\text{N}_{25}$ , containing arginine residues but no free  $\text{NH}_2$ . (I) is readily hydrolysed by pancreatin.

W. McC.

**Osmotic pressure, mol. wt., and stability of amandin, excelsin, and certain other proteins.** N. F. BURK (J. Biol. Chem., 1937, 120, 63—83).—In 6.66M-urea, amandin and excelsin have a mol. wt. approx. one sixth of that in dil. aq. buffer. Both are also denatured and acquire a reactivity with SH reagents. Reduction of mol. wt. and liberation of SH groups also occur in edestin, haemoglobin, and myogen but not in serum-albumin (I) and -globulin, gliadin, and pepsin. Ovalbumin (II) forms SH groups but its mol. wt. is unaltered, indicating that the cystine residue is near the end of a chain. The cystine of (I) and similarly behaving proteins is in a cyclic form. The physical properties of reduced (I) resemble those of myosin. Alterations in  $\eta$  not accompanied by change in the mol. wt. can thus be related to reduction. R. M. M. O.

**Influence of Rontgen rays on van der Waals forces.** J. LOBERING (Ber., 1937, 70, [B], 1963—1966).—Great differences in the ability to swell are observed in many animal tissues before and after exposure to Rontgen rays. Since a similar behaviour is shown by purified technical gelatin the phenomenon is controlled not by the cell but by the physico-chemical structure of the substances involved. The problem is treated mathematically and swelling graphs are given for irradiated and non-irradiated cartilage and its relationship to the  $p_H$  of the solution. H. W.

**Chemical nature of the Reynals spreading factor from mammalian testis.** F. X. AYLWARD (Proc. Soc. Exp. Biol. Med., 1937, 36, 477—481).—The active factor (I) is extracted from minced testis by 0.1N-AcOH and pptd. by  $\text{COMe}_2$ , and can be further purified by dissolution in  $\text{H}_2\text{O}$  and re-pptn. by  $\text{COMe}_2$ . The yield is approx. 2.6 g. per kg. of testis, and the material (20% ash) is stable when heated at  $100^\circ$  for 5 min. (I) in solution gives the protein reactions; it does not dialyse through collodion sacs but can be further purified by electrodialysis, the product containing only a small % of ash.

**Spreading and expansion phenomena of unimolecular layers [of proteins].**—See A., I, 563.

**Dispersion temperature of an intracellular protein, ascaridin.**—See A., I, 565.

**Base exchange in casein.**—See A., I, 564.

**Purple colour in shell-membrane of eggs.** J. BROOKS (Rep. Food Invest. Bd., 1936, 49).—The pigment is not due to the shell porphyrin. A similar coloration is formed by the action of the products of atm. oxidation of, e.g., *o*- or *p*- $\text{C}_6\text{H}_4(\text{OH})_2$  on the membrane. E. C. S.

**Spectroscopic observations of reactions between lactoflavin, the Coulter compound, "cytochrome b," and cytochrome c.** F. URBAN and M. D. EATON (Nature, 1937, 140, 466).—Several

reactions indicate that the porphyrin ring of cytochrome *c* (I) can oxidise the compounds in Coulter's complex responsible for the 574 and 536 m $\mu$ . bands only when the Fe of (I) is in the bi- and not in the trivalent state. L. S. T.

**Different types of phosphorus compounds in milk.** B. N. ACHARYA and S. C. DEVADATTA (Proc. Soc. Biol. Chem. India, 1937, 2, 8).—P compounds are grouped into (1) orthophosphate, (2) pyrophosphate, (3) esters sol. in Ba(OH)<sub>2</sub>, (4) esters insol. in Ba(OH)<sub>2</sub>, (5) "non-esters," including creatinephosphoric acid, hexose mono- and di-phosphates, adenosinephosphoric acid, etc. L. D. G.

**Acidosis and off-flavoured milk.** H. BARKWORTH and L. W. L. COLE (Nature, 1937, 140, 324).—Rothera's test for COMe<sub>2</sub> in the milk of cows suffering from acidosis provides a rapid and trustworthy means of diagnosis. Van Slyke's method of determination (A., 1918, ii, 86) can be used. L. S. T.

**Action of human saliva on diphtheria bacilli.** I. Inhibition of development and spore-killing action. II. Transition of form of the bacilli by the action of human saliva. F. WEIGMANN and A. KOEHN (Z. Hyg., 1936, 118, 507—515, 516—532).—I. The anti-bacterial action of saliva is diminished by brief heating or by passage through a Seitz filter in an indifferent atm. (N<sub>2</sub>). A. G. P.

**Properties, extent, and nature of the action of the antibacterial inhibitory substance (inhibin) of human saliva.** H. DOLD, W. LACHELE, and D. D. HSING (Z. Hyg., 1936, 118, 369—395).—Inhibin (I) which inhibits the growth of diphtheria bacilli is also active, to varying extents, towards other species. Saliva from different persons shows varied activity. (I) is rendered inactive by heating at 100° for 1 min. or at 52—54° for 30 min. and its activity is not restored by addition of small amounts of fresh material. On! On storage saliva separates into an upper aq. layer substantially free from (I) and a lower layer containing the corpuscular elements in which (I) accumulates. At ordinary temp. saliva becomes inactive in 10—15 days. (I) does not pass a Seitz filter, is non-diffusible, insol. in H<sub>2</sub>O, non-precipitable by EtOH, CHCl<sub>3</sub>, or COMe<sub>2</sub>, and is sensitive to light and to drying. It differs from Fleming's lysozyme. A. G. P.

**Anti-bacterial inhibitory agent (inhibin) in nasal mucus.** A. IGNATIUS (Z. Hyg., 1936, 118, 445—454).—Inhibin from nasal secretion has the same properties as that from saliva. A. G. P.

**Spectrophotometry of aqueous solutions of bile.** A. BOUTARIC and M. ROY (Compt. rend., 1937, 205, 258—260).—The product of the optical density of a solution of ox bile and its vol. increases slightly as the vol. increases, when  $\lambda = > 500$  m $\mu$ . With  $\lambda = 500$  m $\mu$ . the val. is max. for undiluted bile, declining at first and subsequently rising as the vol. is increased. Dil. bile increases in optical density on keeping (probable hydrolysis of the constituents), particularly during the first 24 hr., even at 0° and in the absence of air. J. L. D.

**Lithocholic acid gallstones from pig's bile.** R. SCHOENHEIMER and C. G. JOHNSTON (J. Biol.

Chem., 1937, 120, 499—501).—The gallstones (which rarely occur in pigs) contain lithocholic acid, probably as Ca salt. F. O. H.

**Correlation of *in vitro* activity of normal human gastric juice on casein at  $p_H$  7.4 with gastric intrinsic factor.** F. H. L. TAYLOR, W. B. CASTLE, R. W. HEINLE, and M. A. ADAMS (Proc. Soc. Exp. Biol. Med., 1937, 36, 566—568).—The inactivation of gastric juice towards casein (I) at  $p_H$  7.4 suggests that the action on (I) is due to the intrinsic factor. P. G. M.

**Determination of phenol-red in gastric contents.** F. HOLLANDER, A. PENNER, and M. SALTZMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 568—570).—The method used depends on removal of bile pigments and protein with freshly pptd. Zn(OH)<sub>2</sub> and colorimetric comparison of the supernatant liquid with a standard solution of phenol-red. P. G. M.

**Structure of cystine calculi.** E. SZOLD (Orvosi Het., 1935, 79, 1196—1197).—The calculi show a central portion of small phosphatic crystals, surrounded by a semi-amorphous phosphate layer, and in turn by an outer cystine layer. CH. ABS. (p)

**Pathological creatinuria.** L. G. DJEN (Trans. 9th Cong. Far East Assoc. Trop. Med., 1934, 1, 605—612).—The occurrence of creatinuria in certain diseases affords evidence of co-ordination between the activity of endocrine glands and creatine metabolism. CH. ABS. (p)

***p*-Cresol from the urine of pregnant mares.** P. G. MARSHALL (Nature, 1937, 140, 362).—Approx. 110 g. of *p*-cresol, free from *o*- or *m*-isomeride, have been obtained after hydrolysis from 400 gallons of the urine of pregnant mares. (Cf. this vol., 321.) L. S. T.

**Isolation of ascorbic acid from urine.** C. P. STEWART, H. SCARBOROUGH, and P. J. DRUMM (Nature, 1937, 140, 282).—A small amount of a cryst. dinitrophenylhydrazine derivative which appears to be that of ascorbic acid has been isolated from urine. L. S. T.

**Organic phosphates of urine.** J. J. RAE (Biochem. J., 1937, 31, 1622—1626).—Inorg. P is removed with Mg(OH)<sub>2</sub> mixture ( $p_H$  8.8—9.0), an aliquot of the filtrate is digested with 60% HClO<sub>4</sub> + 1 or 2 drops of 30% H<sub>2</sub>O<sub>2</sub>, and the PO<sub>4</sub>''' produced determined colorimetrically. A diet rich in org. P raises the urinary excretion of org. P. P. G. M.

**Errors in analysis of chloride in albuminous urine.** J. SENDROY, jun. (J. Biol. Chem., 1937, 120, 441—445).—Determinations by the Volhard and indicator adsorption methods give inaccurate results unless the urine (especially in nephritis) is deproteinised. The IO<sub>3</sub>' method of Sendroy (cf. this vol., 448) can be used without removal of proteins, and is also applicable to the urine of men taking aspirin. J. N. A.

**Increased oestrogenic potency of human urine after hydrogenation.** G. VAN S. SMITH and O. W. SMITH (Proc. Soc. Exp. Biol. Med., 1937, 36, 460—462).—A marked rise in oestrogenic potency as determined by the author's method (A., 1936, 229)

of the urine of both pregnant and non-pregnant women occurs when Zn is added prior to acid hydrolysis.

P. G. M.

**Colorimetric assay of male hormones in urine.** R. B. OESTING (Proc. Soc. Exp. Biol. Med., 1937, 36, 524—526).—The method used is an adaptation of Zimmermann's  $m\text{-C}_6\text{H}_4(\text{NO}_2)_2$  reaction. The results are correlated with those obtained by the capon comb-growth assay.

P. G. M.

**Porphyria excretion in faeces in normal and pathological conditions.** K. DOBRINER (J. Biol. Chem., 1937, 120, 115—127).—Methods are described for separation and identification of porphyria in faeces. Coproporphyrin-I is excreted in normal and most pathological states. In Pb poisoning, -I and -III were simultaneously excreted, and in pigment cirrhosis of the liver -III alone was isolated. In normal and in certain diseased states, excretion of -I  $\propto$  production of type III compounds (e.g., haemoglobin).

J. L. C.

**Excretion of porphyria by dogs.** K. DOBRINER (Proc. Soc. Exp. Biol. Med., 1937, 36, 757—760).—Coproporphyrin-I is excreted at a const. rate in normal dogs and  $\propto$  the haematopoietic activity.

H. G. R.

(A) **Determination of coproporphyrin and total coproporphyrin I excretion.** K. DOBRINER, W. H. STRAIN, and S. A. LOCALIO. (B) **Coproporphyrin-I metabolism and haematopoietic activity.** K. DOBRINER, W. H. STRAIN, S. A. LOCALIO, H. KEUTMANN, and D. I. STEPHENS (Proc. Soc. Exp. Biol. Med., 1937, 36, 752—754, 755—756).—(A) A photoelectric colorimetric method for determining faecal and urinary coproporphyrin is described.

(B) In haemolytic jaundice and anaemia excretion of coproporphyrin-I  $\propto$  the haematopoietic activity.

H. G. R.

**Total coproporphyrin-I excretion in pernicious anaemia.** K. DOBRINER and W. H. BARKER (Proc. Soc. Exp. Biol. Med., 1937, 36, 864—867).—Increased excretion of coproporphyrin-I and urobilin was observed in the relapse with a return to normal during remission.

H. G. R.

**A constituent of liver preparations highly active against pernicious anaemia.** P. KARRER, P. FREI, and H. FRITZSCHE (Helv. Chim. Acta, 1937, 20, 622).—The P, pentose, and adenine contents of liver preps. can be correlated with their anti-anaemic activity; it is suggested that the activity is due to an adenine nucleotide.

P. G. C.

**Amino-acids (natural and synthetic) as influencing haemoglobin production in anaemia.** G. H. WHIPPLE and F. S. ROBSCHT-ROBBINS (Proc. Soc. Exp. Biol. Med., 1937, 36, 629—632).—In anaemia the dog can use all forms of histidine and phenylalanine for haemoglobin regeneration.

H. G. R.

**Cobalt, and sheep diseases.** J. B. E. PATTERSON (Nature, 1937, 140, 363).—Dartmoor soil on which sheep suffer from a type of anaemia has a mean Co content of 3.9 p.p.m.; lowland soils on which they recover have 16.7 p.p.m. The corresponding vals. for the pastures are 0.20 and 0.45 p.p.m., respectively.

L. S. T.

**Reactions to the alcohol-insoluble fraction of ragweed pollen.** J. Y. FEINSTEIN and R. E. HOYT (Proc. Soc. Exp. Biol. Med., 1937, 36, 816—818).—91% of the reactions from the EtOH-insol. fraction are positive with subjects who do not react to whole ragweed pollen extract, but whose family history is positive to allergic disease.

H. G. R.

**Relation of nicotinic acid and nicotinamide to canine black tongue.** C. A. ELVEHJEM, R. J. MADDEN, F. M. STRONG, and D. W. WOOLLEY (J. Amer. Chem. Soc., 1937, 59, 1767—1768).—Nicotinic acid and its amide cure canine black tongue. The amide is isolated from liver concentrates and may cure pellagra.

R. S. C.

**Microbiological test for carcinogenic hydrocarbons.** S. GOLDSTEIN (Science, 1937, 86, 176—177).—Carcinogenic hydrocarbons, e.g., methylcholanthrene and 1:2:5:6-dibenzanthracene, accelerate the rate of reproduction of *Escherichia communior*. Phenanthrene has no such effect.

L. S. T.

**Spectrographic isolation of carcinogenic substances.** F. ALMASY (Biochem. Z., 1937, 291, 421—428; cf. A., 1936, 1499).—Isolation of carcinogenic substances from complex mixtures (e.g., tars) is facilitated by fractionally distilling the mixtures in a high vac. and examining the vapours spectrographically in an electrically heated quartz tube, those fractions which exhibit spectra similar to those of carcinogenic compounds being subsequently purified by an improved method of chromatographic analysis. In a 60-cm. tube,  $\leq$  approx. 0.01 mg. of 1:2-benzpyrene vapour can thus be detected.

W. McC.

**Oxygen poisoning and tumour growth.** J. A. CAMPBELL (Brit. J. Exp. Path., 1937, 18, 191—197).—Exposure of rats and mice inoculated with various tumours to 5 atm. pressure of  $\text{O}_2$  in no way retarded growth of the tumours. Inoculations from tumours exposed to high  $\text{O}_2$  pressures *in vitro* also grew as vigorously as controls. De Almeida's observation that  $\text{O}_2$  pressure tolerance in animals is increased by starvation was confirmed. Lowering of temp. is also protective.

R. M. M. O.

**Alleged tumour-producing properties of lipin material extracted from Rous sarcoma desiccates.** A. POLLARD and C. R. AMES (Brit. J. Exp. Path., 1937, 18, 198—204).—The extracted material freed from particulate matter has no carcinogenic properties.

R. M. M. O.

**Relationship between autolysis and carcinolysis.** R. KÖNIGSTEIN and R. WILLHEIM (Biochem. Z., 1937, 292, 276—286).—Autolysis of cancerous cells and carcinolysis by normal serum are totally unrelated processes which, e.g., are respectively inhibited and unaffected by presence of peptone or urea. The former is a proteolytic process whilst the latter probably depends on lipin degradation. Neither normal nor cancerous liver-cells show a characteristic autolysis curve.

F. O. H.

**Active fraction of Rous chicken sarcoma.** M. LEVINE and E. J. BAUMANN (Proc. Soc. Exp. Biol. Med., 1937, 36, 820—823).—The active material is

H<sub>2</sub>O-sol. and is probably present in the protein fraction. H. G. R.

**Influence of protein or cystine intake on the cataract-producing action of galactose.** H. S. MITCHELL and G. M. COOK (Proc. Soc. Exp. Biol. Med., 1937, 36, 806—808).—Development of the cataract is increased by protein deficiency but it is doubtful whether cystine is the important factor concerned. H. G. R.

**Serum-carotene in diabetic patients.** G. H. STUECK, G. FLAUM, and E. P. RALLI (J. Amer. Med. Assoc., 1937, 109, 343—344).—Serum-carotene is in all cases > normal and is consistent with the manifestation of clinical symptoms of carotenæmia. R. M. M. O.

**Anti-diuretic substance in eclampsia and other hypertensive diseases: observations on spinal fluid.** G. LEVITT (J. Clin. Invest., 1936, 15, 135—141).—No increase in diuretic substance (posterior pituitary hormone) in the blood was observed in eclampsia and related diseases. CH. ABS. (p)

**Ultracentrifugal concentration of a homogeneous heavy component from tissues diseased with equine encephalomyelitis.** R. W. G. WYCKOFF (Proc. Soc. Exp. Biol. Med., 1936, 36, 771—773).—A heavy protein (mol. wt. approx.  $25 \times 10^6$ ) similar to that obtained from tobacco mosaic virus (A., 1935, 1181) has been isolated from the diseased tissues. H. G. R.

**Analysis of the spleen in Gaucher's disease.** C. A. GRAU and V. OLIVA (Bull. Sci. Pharmacol., 1937, 44, 276—285).—Gaucher's disease is characterised by the presence of kersin in the spleen, no definite variations in the amount being observed. H. G. R.

**Intravenous injection of amino-acids in regeneration of serum-protein following severe experimental hæmorrhage.** R. ELMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 867—870).—Regeneration of serum-protein is more rapid following injection of glucose (I) + a complete mixture of NH<sub>2</sub>-acids than after (I) alone. H. G. R.

**Serum-sodium in relation to liver damage and hyperthyroidism.** S. PEDERSEN, W. G. MADDOCK, and F. A. COLLIER (Proc. Soc. Exp. Biol. Med., 1937, 36, 491—494).—Serum-Na determinations are useless in assessing the advisability of operative treatment of hyperthyroidism. P. G. M.

**Increased urinary excretion of iodine in hyperthyroidism.** G. M. CURTIS and I. D. PUPPEL (Arch. Int. Med., 1937, 60, 498—508).—The average excretion of I in hyperthyroidism is four times normal; in toxic nodular goitre the val. is > that in exophthalmic goitre. The daily variation in hyperthyroidism is > in health. H. G. R.

**Effect of acute infection on the iodine value of the phospholipin fatty acids.** A. V. STOEßER (Proc. Soc. Exp. Biol. Med., 1937, 36, 723—726).—In infections of the upper respiratory tract a decrease in serum-phospholipins was accompanied by an I val. > normal, whereas in convalescence a marked fall in I val. was observed. H. G. R.

**Mechanism of acute inflammation.** V. H. MOON (Arch. Path., 1935, 20, 561—570).—Local vascular and cellular phenomena are due to liberation from injured cells of certain substances, one of which is combined with histamine (I). (I) may also be a factor in the systemic reactions. CH. ABS. (p)

**Atebrin-plasmoquin in treatment of malaria in Uganda.** A. F. BROWN (J. Trop. Med. Hyg., 1935, 38, 301—304). CH. ABS. (p)

(A) Plasma-lipins in chronic hæmorrhagic nephritis. (B) Plasma-lipins in essential hypertension. I. H. PAGE, E. KIRK, and D. D. VAN SLYKE (J. Clin. Invest., 1936, 15, 101—107, 109—113).—(A) Total lipins in nephritic or in normal plasma may be calc. as  $1.3 \times$  total C with an error of <1%. In the chronic active stage of nephritis plasma-lipins approach the upper normal limits (1.0—2.6 g. per 100 c.c.); in the terminal stages vals. decrease and may finally reach < normal. Relative proportions of cholesterol (I), (I) esters, phosphatides (II), and neutral fats remain substantially unchanged during these changes. The high N/P ratio (3—18) of the terminal lipin indicates that it is present in fractions other than (II). The severity of lipæmia is not paralleled by the plasma-protein deficit.

(B) Hypertension cannot be associated with plasma-lipin or with any lipin fraction. CH. ABS. (p)

**Serum-protein changes occurring in degenerative stages of Bright's disease.** E. JAMESON (Proc. Soc. Exp. Med., 1937, 36, 808—812).—A decrease in euglobulin and albumin together with the presence of another fraction absent from normal serum was demonstrated by salting-out curves. H. G. R.

**Chemical diagnosis of pregnancy.** J. PATTERSON (Brit. Med. J., 1937, 522—525).—The method is based on the bacterial (*B. coli*) fission of the oestriol glycuronide in urine, followed by detection of oestriol by means of the colour test with C<sub>6</sub>H<sub>3</sub>(OH)(SO<sub>3</sub>H)<sub>2</sub>. A. G. P.

**Intravenous manganese in treatment of psoriasis.** J. BARR (J. Med. Soc. New Jersey, 1935, 32, 376—379).—Favourable effects of MnCl<sub>2</sub>-CaCl<sub>2</sub> injections are recorded. CH. ABS. (p)

**Review of literature on effects of breathing dusts with special reference to silicosis.** D. HARRINGTON and S. J. DAVENPORT (U.S. Bur. Mines, 1937, Bull. 400, 305 pp.).—527 publications are cited.

**Effect of arsenobenzene preparations on mice infected with *Trypanosoma cruzi*.** T. MINAGUCHI and Z. RIN (Japan. Z. Mikrobiol. Path., 1935, 29, 1495—1502).—Arsenobenzene-Na and neoarsenobenzene have neither preventive nor curative properties. CH. ABS. (p)

**Comparative effectiveness of chemical sprays in protecting monkeys against nasally instilled poliomyelitis virus.** P. K. OLITSKY and A. B. ŠABIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 532—535).—ZnSO<sub>4</sub> was the most effective of the protective agents examined, being more potent than tannic acid, FeSO<sub>4</sub>, or K alum. P. G. M.

**Change in rate of respiratory metabolism in a teleost fish induced by acclimatisation to high and low temperature.** N. A. WELLS (Biol. Bull., 1935, 69, 361—367).—*Gillichthys mirabilis* acclimatised at a high temp. has a lower rate of  $O_2$  metabolism at intermediate temp. than that acclimatised at a low temp. CH. ABS. (p)

**Relations between respiratory metabolism in fishes and susceptibility to certain anaesthetics and lethal agents.** F. B. SUMNER and N. A. WELLS (Biol. Bull., 1935, 69, 368—378).—Respiratory rates and susceptibility to urethane (I) of *Fundulus parvipinnis* and *Gillichthys mirabilis* were greater at high than at low temp. Fishes acclimatised at high temp. and transferred to a medium temp. exhibited lower respiratory rates and susceptibility to (I), chlorotone,  $Et_2O$ , KCN, and to asphyxiation than did those acclimatised at a low temp. CH. ABS. (p)

**Tissue respiration of normal and scorbutic guinea-pig's liver and kidney.** E. STOTZ, C. J. HARRER, M. O. SCHULTZE, and C. G. KING (J. Biol. Chem., 1937, 120, 129—140).— $O_2$  consumption and  $CO_2$  production of liver are increased in scurvy whilst  $O_2$  consumption of kidney, aerobic and anaerobic glycolysis in liver, and aerobic glycolysis in kidney are unchanged. Addition of vitamin-C to normal and scorbutic liver and kidney increases the  $O_2$  consumption, the increase being equiv. to the amount of -C oxidised. J. L. C.

**Effect of phloridzin [on tissue respiration].** W. FLEISCHMANN (Biochem. Z., 1937, 291, 415—420).—The  $O_2$  uptake of surviving rat's liver and kidney, with and without addition of glucose (I), is not affected by addition of phloridzin (II), whilst that of cerebral cortex is affected only in presence of (I). The increased  $O_2$  uptake caused by added (I) in cortex and in yeast is counteracted by addition of (II) (which is adsorbed by yeast). In the body, (II) probably prevents the absorption of (I) by the kidneys and other organs. W. McC.

**Renal oxygen utilisation of dogs with experimental hypertension.** M. F. MASON, R. EVERS, and A. BLALOCK (Proc. Soc. Exp. Biol. Med., 1937, 36, 819—820).—No variation in the renal arteriovenous  $O_2$  difference in fasting dogs is caused by partial constriction of the renal artery with or without hypertension. H. G. R.

**Metabolic effects of the white bean.** A. ILLENYI and L. ZSELYONKA (Biochem. Z., 1937, 291, 266—270).—In rats, a diet containing 25% of white bean meal diminishes the basal metabolic rate but does not affect the blood-sugar level. The metabolism apparatus of Belak and Illenyi (A., 1936, 91) is more suitable for use with small animals than is that of Benedict. W. McC.

**Nutritional value of some Indian diets.** D. N. MULLICK and J. T. IRVING (Nature, 1937, 140, 319—320).—The vals. of N. Indian and two Hindu diets are compared for rats. L. S. T.

**Nutritive values of "Glaxo" and "light white" caseinogens.** A. F. MORGAN and E. O. GREAVES (Biochem. J., 1937, 31, 1553—1555).—The superiority

of "light white" over "Glaxo" caseinogen when fed to rats in vitamin tests (cf. A., 1929, 1203) cannot be ascribed to superior val. as protein. Both caseinogens have similar growth and maintenance vals., which are < those of crude acid-pptd. preps. J. L. C.

**Influence of cod-liver oil in the diet on susceptibility to oxidation of fat of pig.** C. H. LEA (Rep. Food Invest. Bd., 1936, 73—75).—The fat laid down has a slightly fishy flavour and is abnormally susceptible to oxidation. E. C. S.

**Beneficial effect of non-saponifiable fraction of soya-bean oil on chicks fed a simplified diet.** S. H. BABCOCK, jun., and T. H. JUKES (Proc. Soc. Exp. Biol. Med., 1937, 36, 720—721).—The results of Goettsch and Pappenheimer (A., 1936, 1141) have been confirmed, although the chicks on the supplemented diet were < normal wt. H. G. R.

**Relative value of the proteins of certain food-stuffs in nutrition.**—See B., 1937, 1127.

**Growth-stimulating effect of egg-white: its importance for embryonic development.** G. SCHMIDT (Enzymologia, 1937, 4, Part II, 40—48).—Development does not begin in chick embryos if the org. constituents of the white are absent and hence (restricted) development proceeds in solutions of inorg. salts (e.g., Ringer's solution) only if started in presence of these constituents. Some such solutions irreversibly prevent development. The constituents which stimulate development retain their activity in white diluted 20-fold. Mixtures of the proteins and dialysable substances (but not either separately) stimulate development. Glucose in concns. < those in which it occurs in the white has a growth-promoting effect which differs qualitatively from that of the white. W. McC.

**Relative participation of proteins and fats in the production of energy during inanition.** E. F. TERROINE and S. SYNEPHIAS (Compt. rend., 1937, 205, 390—392).—Throughout the period of inanition after reserve carbohydrates have been metabolised and before the pre-mortal rise in urinary N, the proportion of the energy output supplied by fats or proteins is const. but the % of the total energy supplied by either varies in different species. J. L. D.

**Is lysine the fundamental factor which limits the production of milk in cases of deficient nitrogen feeding?** A. LEROY (Compt. rend. Acad. Agric. France, 1937, 23, 67—76).—The lysine content of the ration is a fundamental factor in N metabolism and utilisation. The distribution of  $NH_2$ -acids in common feeding stuffs is recorded. A ration of grain, bran, and ground-nut (1.5 : 1.5 : 1) ensures an adequate supply of lysine for milk production. Such a diet contains tryptophan, cystine, arginine, and histidine in excess of requirements. A. W. M.

**Adenosinetriphosphoric acid and its decomposition products in muscles, the functional capacity of which is lowered.** O. I. FAINSCHMIDT [with A. I. TSCHERNIAK] (Biochimia, 1937, 2, 621—629).—The adenosinetriphosphoric acid (I)-P content (mg. per 100 g. dry tissue) of the muscles of river turtles rises from 72.0 in winter to 120.2 in summer,

and the  $\text{H}_4\text{P}_2\text{O}_7\text{-P}$  falls from 18.4 to 2.9, the  $\text{H}_3\text{PO}_4\text{-P}$  from 216.8 to 197.6, and the adenylic acid-N from 7.6 to 0.9. Phosphocreatine-P rises from 72.3 to 136.3 over the same period. The results suggest that the decomp. products of (I) tend to accumulate in the muscles of hibernating animals. R. T.

**Influence of training on the adenosine triphosphate content of rabbit, pigeon, and chicken muscle.** V. I. ROZENGART (Biochimia, 1937, 2, 657—665).—The adenosine triphosphate content of rabbit, pigeon, and chicken skeletal muscle falls as a result of training, to about 90% of the untrained val. R. T.

**Production by animal tissues of tryptamine from tryptophan and of tyramine from tyrosine.** E. WERLE and G. MENNICKEN (Biochem. Z., 1937, 291, 325—327; cf. this vol., 304).—Aq. extracts of the kidney of rabbits and guinea-pigs (but not of the kidney of dogs, goats, pigs, monkeys, or oxen, or of liver, spleen, lung, or pancreas) decarboxylate tyrosine (I) and tryptophan (II). The decarboxylation is not caused by bacteria. The enzymes responsible for decarboxylation of (I), (II), and histidine are inhibited by 0.001M-HCN and are possibly identical. Tyramine and tryptamine are not attacked by histaminase. W. McC.

**Amino-acid catabolism. IV. Fate of certain  $\alpha$ -amino-acids subcutaneously injected into normal dogs.** J. A. LEIGHTY and R. C. CORLEY (J. Biol. Chem., 1937, 120, 331—334).—With *dl*-alanine and *dl*-valine, straight-chain  $\text{NH}_2$ -acids yielded their N as urea, whilst those with Me and  $\text{NH}_2$  on the same C lost N only with difficulty. Me on C adjacent to those carrying  $\text{NH}_2$  interfered with deamination. J. N. A.

**Degradation of amino-acids by animal tissues.** F. LIEBEN and R. KRETSCHMAYER (Enzymologia, 1937, 3, Part I, 21—25).—Pulp from the liver and kidneys of guinea-pigs, rats, and rabbits enzymically deaminates *dl*-phenylalanine (I) and *dl*-histidine (II), kidney-pulp acting more rapidly on (I) and liver-pulp more rapidly on (II). Neither pulp has any appreciable effect on *l*- or *dl*-tyrosine, *l*-tryptophan, or *l*-adrenaline. W. McC.

**Formation and breakdown of amino-acids.**—See A., II, 448.

**Urea, creatinine, and ammonia excretion in dogs in acidosis.** A. S. ALVING and W. GORDON (J. Biol. Chem., 1937, 120, 103—113).—Acidosis was produced by feeding  $\text{CaCl}_2$  to dogs with kidneys explanted and the results are compared with those obtained from the same animals on a low-protein diet. Acidosis caused no change in the ratio of the clearances of urea (I) and creatinine (II). The renal blood flow was the same calc. from the extraction and excretion rates of (I) or (II). If (I) +  $\text{NH}_3$  were substituted for (I), the above ratio was increased in acidosis and the renal blood flow was > that calc. from (II). (I) is probably not the source of  $\text{NH}_3$  formed in the dog's kidney. J. L. C.

**Production of urea in the mammary gland.** W. R. GRAHAM, jun., O. B. HOUGHIN, and C. W. TURNER (J. Biol. Chem., 1937, 120, 29—33).—  
2\*\* (A., III.)

The urea content of blood obtained under appropriate conditions from the mammary vein in lactating goats is consistently > that of the arterial blood. It is suggested that urea is formed in the gland as a by-product of the synthesis of lactose from proteins, which may thus form the basis of the milk-stimulating effect of high-protein diets. R. M. M. O.

**Hepatic excretion in the dog following oral administration of various bile pigments.** H. DOUBILET (Proc. Soc. Exp. Biol. Med., 1937, 36, 687—690).—The largest excretion of bile acids (I) follows administration of the natural (I) of the dog, whilst ox bile salts and glycocholic acid are more efficient than the unconjugated cholic and deoxycholic acids. H. G. R.

**Lecithinaemia following the administration of fat.** G. HEVESY and E. LUNDGAARD (Nature, 1937, 140, 255—276).—Determinations of the proportion of radioactive to ordinary P in the lecithin (I) of the blood and of the intestine of a dog fed with olive oil and radioactive Na phosphate show that the additional lecithin found in the blood contains only a small amount of active P. This supports the view that during the absorption of neutral fats (I) is formed outside the intestinal tract. L. S. T.

**Photo-electric spectrophotometry applied to studies in fat metabolism.** E. S. MILLER and G. O. BURR (Proc. Soc. Exp. Biol. Med., 1937, 36, 726—729).—Eläostearic acid is rapidly changed after ingestion into another acid with high absorption at 2350 Å. H. G. R.

**Fatty acids and glucose in the blood of depancreatized dogs.** A. L. LICHTMAN (J. Biol. Chem., 1937, 120, 35—40).—The rise in blood-fatty acid level does not occur until the blood-sugar has reached 0.24—0.30%. The blood-fats increase as carbohydrate oxidation decreases. Ingestion of glucose in the normal, but not in the depancreatized, dog effects a lowering of the blood-fat. R. M. M. O.

**Free sugar concentration of livers of rats absorbing glucose and fructose, in relation to glycogen synthesis.** J. P. FLETCHER and E. T. WATERS (Biochem. J., 1937, 31, 1830—1836).—There is no appreciable difference in free sugar in livers of rats absorbing either fructose (I) or glucose (II). The liver and venous blood of rats absorbing (I) contain only traces of (I) so that its utilisation [either by conversion into (II) or glycogen (III) or by oxidation] keeps pace with its absorption. The absorption coeffs. are: (I) 160, (II) 250—360 mg. per 100 g. per hr. Various possibilities for the greater (III)-producing power of (I) are discussed. Insulin inhibits (III) production from (I) in quantities those necessary for inhibition in the case of (II). Either (II) is not an intermediary in (III) production from (I) or insulin inhibits formation of (II) from (I). R. M. M. O.

**Selective glucose absorption.** F. VERZAR and H. WIRZ (Biochem. Z., 1937, 202, 174—181).—With rats at 38°, approx. 30% more glucose (I), but not xylose (II), is absorbed from the upper half of the small intestine than from the lower half. At 24°, the absorptions of (I) are proportionately smaller,

but that of (II) is not affected; the rate of absorption of (I) also becomes dependent on (I) concn. The toxic action of  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  on the upper half is  $>$  that on the lower, both at  $24^\circ$  and at  $38^\circ$ . F. O. H.

**Fate of mono- and di-isopropylideneglucose in the animal organism.** E. DINGEMANSE and E. LAQUEUR (*Enzymologia*, 1937, 4, Part II, 57—64).—Monoisopropylideneglucose (I) is harmless but the di-compound (II) is toxic to rats and rabbits.  $\text{COMe}_2$  in doses of 0.5 g. per kg. subcutaneously injected into rabbits is recovered to the extent of 98.5% in the expired air within 46 hr., no toxic effects being produced. After oral or subcutaneous administration to rabbits of (I) 85% of the combined  $\text{COMe}_2$  is found unchanged in the urine and 9% in the expired air. The corresponding vals. for (II) are: urine 30—60%, expired air 25%, the  $\text{COMe}_2$  in the urine being present as (I) mixed with small amounts of (II). Free  $\text{COMe}_2$  is not found in the urine and free or combined  $\text{COMe}_2$  is found in the faeces in traces only after administration of (II). W. McC.

**Glycolysis of the retina.** L. CALIFANO (*Atti R. Accad. Lincei*, 1937, [vi], 25, 93—100).—Glycolysis of the retina (ox), as indicated by the anaerobic glycolytic coeff. and lactic acid formation, with glucose (I) or mannose as substrate is that with fructose, galactose, arabinose, xylose, or hexose mono- or di-phosphate. Thus the glycolysis, which is inhibited by 0.001N- $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ , is essentially one of (I). F. O. H.

**Resynthesis of muscle-glycogen from hexose monophosphate.** C. F. CORI, G. T. CORI, and A. H. HEGNAUER (*J. Biol. Chem.*, 1937, 120, 193—202).—In frog's muscle aerobically recovering from tetanic stimulation, disappearance of hexose monophosphate (I) and lactic acid (II) is related to glycogen resynthesis. Poisoning with  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  does not affect the rate of disappearance of (I), and when more (I) than (II) is present, the disappearance of (I) is  $>$  that due to the glycogen resynthesised from sources other than (II). (I) appears to be reconverted into glycogen without being first converted into (II). J. L. C.

**Phosphagen formation and oxidation of triose phosphate in muscle extract.** J. M. INNES (*Biochem. J.*, 1937, 31, 1586—1594).—Aerobic formation of creatine phosphate is demonstrated in absence of free inorg.  $\text{PO}_4'''$  but presence of hexose diphosphate (I) and  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  (II), or in presence of inorg.  $\text{PO}_4'''$ , (I), and (II) or NaF. The formation in presence of  $\text{F}'$ , but not of (II), is at the expense of inorg.  $\text{PO}_4'''$ . The energy necessary for phosphorylation in the presence of (II) is not obtained by oxidation of triose phosphate (III) but by breakdown of phosphopyruvate formed by such oxidation. The energy for phosphorylation in  $\text{F}'$ -poisoned extracts is obtained from coupled dismutation alone or possibly together with oxidation. (III) dehydrogenase is probably not concerned in the oxidation-reduction reaction of (III) with  $\text{AcCO}_2\text{H}$ . P. W. C.

**Interchangeability of pyruvic and oxaloacetic acids as hydrogen acceptors in muscle glycolysis.** J. K. PARNAS and W. SZANKOWSKI

(*Enzymologia*, 1937, 3, 220—227).— $\text{NH}_3$  production in muscle poisoned with NaF and in the presence of hexose diphosphate is suppressed by oxaloacetic acid (I) as with  $\text{AcCO}_2\text{H}$  (II) (A., 1936, 511). In anaerobic glycolysis (I) probably serves as H carrier from phosphoglyceraldehyde to (II). In aerobic glycolysis the same H would eventually unite with O. A. L.

**Pyruvate oxidation in brain. II. Oxygen: pyruvate ratio and respiratory quotient.** G. K. MCGOWAN (*Biochem. J.*, 1937, 31, 1627—1636; cf. this vol., 76, 386).—Not all the pyruvate which is metabolised by pigeon's brain is completely oxidised. The formation of lactic acid affords only a partial explanation of the low  $\text{O}_2$ : pyruvate ratio, the bearing of which on the mode of action of vitamin- $\text{B}_1$  is discussed in relation to avitaminous brain.

P. G. M.

**Rôle of citric acid in intermediate metabolism in animal tissues.** H. A. KREBS and W. A. JOHNSON (*Enzymologia*, 1937, 4, Part II, 148—156).—Citric acid (I) catalytically promotes oxidation in muscle, especially in the presence of carbohydrate. In determinations of the rate of oxidative removal of (I) from muscle, the max. val. for  $Q_{\text{citrate}}$  was —16.9.  $\alpha$ -Ketoglutaric acid (II) and succinic acid (III) were found as products of oxidation of (I). Oxaloacetic acid (IV), if added to muscle, condenses with an unknown substance, probably a triose, derived from carbohydrate, to form (I), which on further oxidation regenerates (IV). The net effect of the cycle is the complete oxidation of triose. The intermediate steps in the cycle are: (I)  $\rightarrow$  isocitric acid  $\rightarrow$  oxalosuccinic acid  $\rightarrow$  (II)  $\rightarrow$  (III) fumaric acid  $\rightarrow$  malic acid (IV), which with triose regenerates (I). Quant. data suggest that the (I) cycle is the preferential pathway by which carbohydrate is oxidised in animal tissues. P. W. C.

**Site of formation of citric acid in the animal body.** J. M. ORTEN and A. H. SMITH (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 555—556).—Citric acid formed following injection of Na malate into rats is produced mainly in the kidney. P. G. M.

**Deuterium as indicator in the study of intermediary metabolism. IX. Conversion of stearic acid into palmitic acid in the organism.** R. SCHOENHEIMER and D. RITTENBERG (*J. Biol. Chem.*, 1937, 120, 155—165; cf. this vol., 130).—The D content of palmitic acid (I) isolated from mice fed with D-containing stearic acid (II) for 5 days indicated (II) as the source of (I). Removal of traces of contaminating D-containing substances from D-containing fatty acids and separation of the acids are effected by vac. distillation of the Me esters. J. L. C.

**Deuterium as indicator in the study of intermediary metabolism. X. Metabolism of butyric and hexoic acids.** D. RITTENBERG, R. SCHOENHEIMER, and E. A. EVANS, jun. (*J. Biol. Chem.*, 1937, 120, 503—510; cf. preceding abstract).—Following administration to mice of D-containing Na butyrate and hexoate (D in the  $\alpha$  and  $\beta$  and  $\alpha$ ,  $\beta$ ,  $\gamma$ , and  $\delta$  positions, respectively; prepared from  $\text{D}_2$ - $\text{PtO}_2$  with Et crotonate and sorbate, respectively), the acids are not detectable in the body whilst the

body-fluids contain  $D_2O$ . No D-containing higher fatty acids are present. Hence butyric and hexoic acids are not fat-formers but are rapidly and completely degraded by the animal. F. O. H.

**Nitrogen isotope ( $^{15}N$ ) as a tool in the study of the intermediary metabolism of nitrogenous compounds.** R. SCHOENHEIMER, D. RITTENBERG, M. FOX, A. S. KESTON, and S. RATNER (J. Amer. Chem. Soc., 1937, **59**, 1768).—Administration of hippuric acid (I) or glycine and  $BzOH$  containing much  $^{15}N$  to dogs leads to excretion of (I) containing much  $^{15}N$ . (I) is thus absorbed from the intestinal tract without hydrolysis, and glycine can be directly used for its formation. R. S. C.

**Absorption of radio-sodium in normal human subjects.** J. G. HAMILTON (Proc. Nat. Acad. Sci., 1937, **23**, 521–527; cf. this vol., 175).—The absorption of orally administered  $^{24}Na$  by normal human subjects begins within a few min. and in some cases appears complete in 3–10 hr. E. M. W.

**Deposition of radio-phosphorus in tissues of growing chicks.** S. F. COOK, K. G. SCOTT, and P. ABELSON (Proc. Nat. Acad. Sci., 1937, **23**, 528–533; cf. this vol., 308).— $^{32}P$  is deposited in all the tissues of growing chicks examined but principally in the bones and muscle. E. M. W.

**Absorption of iron compounds from the upper part of the small intestine.** J. GROEN and F. H. L. TAYLOR (Proc. Soc. Exp. Biol. Med., 1937, **36**, 694–695).—The apparent absorption is due to combination with, or absorption of the highly ionisable Fe salts by, the mucus. H. G. R.

**Calcium-phosphorus ratio in different tissues, particularly in the femur of the rabbit during growth.** J. ALQUIER and A. MICHAUX (Compt. rend., 1937, **205**, 177–178).—The % of Ca and the total Ca content of the femur increase with age, the vals. being nearly the same for different litters. The total P content increases similarly, but the % of P varies considerably. Thus the Ca/P ratio varies (1.01–2.22) from litter to litter, especially in young rabbits. In older animals (68 days) the ratio is 1.69–1.73. For the stomach and brain the Ca/P ratio is const. after 1 month, but only after 2 months for the muscles and liver. J. L. D.

**Electrolytes in nutritional muscular dystrophy in rabbits.** W. O. FENN and M. GOETTSCH (J. Biol. Chem., 1937, **120**, 41–50).—The dystrophy is associated with a gain in  $Cl'$  and a loss in  $Mg''$ ,  $K'$ , and creatine in the total muscle, which are respectively associated with proportionate increases in the interstitial fluid and decreases in the no. of intact cells. Increased Ca and P occur when there is calcification. R. M. M. O.

**Effect of fatigue on post-mortem changes in muscle.** E. C. B. SMITH (Rep. Food Invest. Bd., 1936, 21–25).—The buffer index and %  $H_2O$ ,  $PO_4'''$ , and  $Cl'$  of rats' muscles are little changed as a result of several hr. exercise. In the range of  $p_H$  6.0–8.0 the proteins effect only 40% of the total buffering of rigor muscle. E. C. S.

**Biological effects of the rays produced by a cyclotron.** M. NAKAIDZUMI, K. MURATI, and Y. YAMAMURA (Nature, 1937, **140**, 359).—Photomicrographs showing the effect of irradiation from a Be target bombarded with 2.8-m.v. deuterons from a cyclotron on the spleen and testicles of mice are reproduced. L. S. T.

**Response of the skin to radiation.** J. D. HARDY (Physical Rev., 1936, [ii], **49**, 868).—Data relating to the response of white, human skin to the heating effects of visible light (0.4–0.8  $\mu$ .), near (0.8–2.5  $\mu$ .) and far (3  $\mu$ .) infra-red radiation are recorded. L. S. T.

**Proposed chemical mechanisms for the production of skin erythema and pigmentation by radiant energy.** L. E. ARNOW (Science, 1937, **86**, 176).—Mainly a discussion. In presence of  $O_2$ , tyrosine is converted into 3:4-dihydroxyphenyl-alanine (I) by ultra-violet light. Skin pigmentation produced by radiant energy may be the direct result of this change, (I) being converted into melanin by the (I)-oxidase. L. S. T.

**Artificial mutations under the combined influence of X-rays and salts of heavy metals in *Drosophila melanogaster*.** N. N. MEDVEDEV (Bull. Inst. Genetics U.S.S.R., 1935, No. 10, 211–222).—X-Irradiation of *Drosophila* cultured on media containing 1% of  $Pb(OAc)_2$  caused a higher frequency of mutation than did the action of X-rays alone.

CH. ABS. (p)

**(A) Acid formation in frozen and thawed *Arbacia punctulata* eggs: its bearing on the problem of activation.** (B) Influence of iodoacetate on activation and development of the eggs. J. RUNNSTROM (Biol. Bull., 1935, **69**, 345–350).—(A) Acid is formed in eggs during thawing after freezing at  $-80^\circ$ . 0.03M- $CH_2I-CO_2Na$  (I), 0.06M- $NaF$ , 0.0004% aq.  $CuCl_2$ , and pyocyanine did not inhibit acid production; hexose monophosphate did not increase it. The acidity is unrelated to lactic acid.

(B) Enzymic or other activities in which SH groups are concerned have no essential part in fertilisation of the eggs since the latter is unaffected by (I). (I) is harmful to the development of fertilised eggs, and its effect is not prevented by lactic acid or  $AcCO_2'$ . Carbohydrate breakdown is probably an essential factor in the morphological differentiation of the anterior part of the larva. CH. ABS. (p)

**Glycylglycine as a sea-water buffer.**—See A. I, 585.

**Action on metabolism of Carlsbad mineral waters.** II. A. KERN and E. STRANSKY (Arch. exp. Path. Pharm., 1937, **185**, 403–410).—The activities of rabbit liver-sulphatase, blood-amylase, and serum-lipase are increased by administration of the waters for 4 weeks whilst administration for a long time increases glycogen formation in rabbit, guinea-pig, and rat liver, the effect with rat being detectable only under special conditions. A diet rich in protein inhibits liver-glycogen deposition in rat. P. W. C.

**Influence of copper and a liver fraction on retention of iron.** A. P. BARER and W. M. FOWLER

(Arch. Int. Med., 1937, 60, 474—481).—Addition of Cu caused a decreased retention and increased utilisation of Fe when the latter was given in moderate doses, but had no effect when the dose of Fe was considerably increased. Liver extract caused a slightly reduced retention of Fe, but no increase in hæmoglobin was observed with the additions.

H. G. R.

**Diffusion of gold injected into the body of the guinea-pig.** S. PINA DE RUBIES (Anal. Fís. Quím., 1937, 35, 72—75).—The distribution of Au in the organs of the guinea-pig after death by Au poisoning is determined spectrographically by the author's method (A., I, 336) and the qual. distribution of other elements investigated.

F. R. G.

**Cardiac activity in the foetal rat.** E. L. CORY (J. Exp. Zool., 1935, 72, 127—145).—Aq. lactic acid (0.1%), applied direct to foetuses or injected into the maternal circulation, produced irregular heart-beats similar to those in asphyxia. Alkaline solutions (aq.  $\text{NH}_3$ ,  $\text{NaHCO}_3$  in Locke solution) had no action. The foetal heart does not react to adrenaline or to adrenine secretion.

CH. ABS. (p)

**Electrolytes of blood and urine of dogs with acute hepatic injury produced by arsphenamine.** L. J. SOFFER, D. A. DANTES, and H. SOBOTKA (Arch. Int. Med., 1937, 60, 509—521).—After administration of arsphenamine an increase in the vol. of urine and excretion of lactic acid (I) and protein together with a decrease in excretion of  $\text{Cl}'$  and inorg.  $\text{PO}_4'''$  were observed; in the blood a decrease in serum- $\text{Cl}'$  and  $\text{CO}_3''$  and an increase in inorg.  $\text{PO}_4'''$  and  $-(\text{I})$  were accompanied by a pronounced hæmo-concn.

H. G. R.

**Respiratory effects of substituted phenols at varying carbon dioxide tensions.** M. E. KRAHL, A. K. KELTCH, and G. H. A. CLOWES (Proc. Soc. Exp. Biol. Med., 1937, 36, 700—702).—Stimulation of oxidation is favoured by high intracellular concns. of the dissociated form, and inhibition of oxidation and reversible block to cell division by high intracellular concns. of the undissociated form, of substituted phenols.

H. G. R.

**Sensitivity of the organism to drugs in acid and alkaline conditions.** E. S. ROSOVSKA and A. I. TSCHERKES (Méd. exp. Ukraine, 1934, No. 1, 50—61).—During ingestion of a mixed diet, subcutaneous injection of Na salicylate is followed by an increase in blood-salicylic acid (I) reaching max. in 1—2 hr. and declining to zero in 24 hr. Elimination of salicylates in urine reaches 12—30% of the amount injected and is completed in 24 hr. in many cases. During use of acid foods the max. (I) is reached much later, and with alkaline foods much earlier. Urinary elimination is similarly affected, and in the case of alkaline food amounts to 35—70% of the quantity given.

CH. ABS. (p)

**Action of p-aminophenol on tissue oxidations.** F. BERNHEIM and M. L. C. BERNHEIM (Science, 1937, 86, 197).—At  $p_H$  6.4—6.7, 0.0002M- $p\text{-NH}_2\text{-C}_6\text{H}_4\text{-OH}$  inhibits the  $\text{O}_2$  uptake of rat liver suspensions by 50%. In higher concns. the inhibition is masked by oxidation to the quinone. PhOH

and  $\text{NH}_2\text{Ph}$  in 2—4 times the concn. produce inhibitions of only 5—20%. Salicylic acid and  $\text{NHPhAc}$  are relatively ineffective.

L. S. T.

**Effect of drugs in the production of agranulocytosis with particular reference to amidopyrine hypersensitivity.** W. DAMESHEK and A. COLMES (J. Clin. Invest., 1936, 15, 85—97). CH. ABS. (p)

**Bile stimulants.** V. V. ZVEREV (Chim. Farm. Prom., 1935, No. 2, 126—128).— $(\text{CH}_2)_6\text{N}_4$  and Decholin produce marked bile stimulation in rabbits.

CH. ABS. (p)

**Biological action of an o-aminoazo-derivative of the pyrazole group.** G. B. CRIPPA and R. FERRARI (Riv. Biol., 1937, 22, 504—507).—Oral administration of 5-amino-4-benzeneazo-1-phenyl-3-methylpyrazole (I) (method of synthesis indicated) to man causes albuminuria whilst parenteral injection is attended by unpleasant symptoms. (I) appears to have a urinary antiseptic activity. The min. lethal dose in rabbits is 0.20 g. per kg. body-wt.

F. O. H.

**Pharmacological action of cystamine, a blood-pressure lowering substance.** H. ROBBERS (Arch. exp. Path. Pharm., 1937, 185, 461—491).—Cystamine (I) decreases the blood pressure powerfully, the action being initially on the peripheral circulation. In cats, subcutaneous injection of 45 mg. per kg. reduces the blood pressure by 60 mm. Hg over a period of 4—8 hr. (I) is inactive when given by mouth, and in concns. of 1 : 100 does not affect the isolated frog's heart. Rat uterus is unaffected by (I) up to a concn. of 1 : 8000 and is then inhibited.

P. W. C.

**Uterus-stimulating, depressor, and bladder-contracting activities in extracts of rat's submaxillary gland.** G. F. KOEFF and J. F. MEZEN (J. Pharm. Exp. Ther., 1937, 60, 407—419).—The gland contains an uterus-stimulating principle, and also a substance which lowers the blood pressure of the etherised cat and contracts an isolated ring of cat's bladder and the isolated intestine of the guinea-pig. Very probably all these activities are produced by a single substance which is not histamine, acetylcholine, pitocin, the "histamine-like" substance of other tissue extracts, or adenosine.

J. N. A.

**Action of histamine in comparison with other amines and ammonia on the frog and on frog's heart. Chemical constitution and pharmacological action.** K. SIGG (Arch. exp. Path. Pharm., 1937, 185, 644—654).—The action of histamine (I) on the frog and frog's heart is compared with that of 18 other amines,  $\text{NH}_2$ -acids, amides, and  $\text{NH}_3$ . With the frog doses of (I) over 3000 times > those for warm-blooded animals are required before any effect is registered. The activity of these high concns. is not sp. for the various mols. but is due to the  $\text{NH}_2$  action of the  $\text{NH}_2$  group and with amines is the greater the more  $\text{NH}_2$  groups in the mol.

P. W. C.

**Biological action of carnitine and acetyl-carnitine.** E. STRACK and K. FÖRSTERLING (Arch. exp. Path. Pharm., 1937, 185, 612—621).—With mouse intestine, up to 0.05% of carnitine (I) or acetylcarnitine (II) has no effect whilst 0.25—1% causes relaxation. With frog's rectus and leech

muscle, 100 mg. of (I) acting for 45 min. has only the same effect as 3  $\mu$ g. of acetylcholine acting for 3 min. (II) is only 2/3 as active as (I) with these two types of muscle. With frog's heart (I) and (II) have the same activity but are 50 and  $5 \times 10^5$  times less active than choline (III) and acetylcholine respectively. Atropine does not inhibit the action of (I). (I) is frequently accompanied by (III) and difficult to separate from it, and such impure (I) may show, especially after acetylation, considerable activity. (I) and (II) affect the heart beat of warm-blooded animals in the same way as of frog's heart.

P. W. C.

**Influence of ovary lysate on egg production in hens.** V. UNIX and S. VOLKOVUISSKAJA (Probl. of Animal Husbandry U.S.S.R., 1935, No. 3, 86—98).—Injection of the lysate increased egg production. It has not a sp. organotropic influence on the organ from which it is prepared, but exerts a "common protein effect" in stimulating all functions, notably gastric activity, and production of hæmoglobin and erythrocytes in blood. The action of the injections is somewhat influenced by the N content.

CH. ABS. (p)

**Diffusion of ions through collodion membranes treated with urethanes.** E. PONDER and J. C. ABELS (Proc. Soc. Exp. Biol. Med., 1937, 36, 551—553).—The retarding effect of urethanes on the passage of SCN' through collodion membranes is sp. and does not extend to Cl', SO<sub>4</sub>'', etc. When the membranes contain 0.01—0.1% of lecithin and cholesterol, the narcotics accelerate the diffusion of SCN', but do not affect that of the other ions. P. G. M.

**Barbituric acids containing the 2-methylallyl group.**—See A., II, 468.

**Effect of the purification of piperidine on the activity of derived local anæsthetics.**—See A., II, 467.

**Tribromomethyl borate.**—See A., II, 396.

**Influence of the anion on the action of salts of novocaine and morphine on motor nerves; different qualitative effects depending on the concentration.** J. RÉGNIER and A. QUEVAUVILLER (Compt. rend., 1937, 205, 251—254; cf. A., 1936, 893, 634; this vol., 309).—Effects of the salts on the motor nerves of *Rana esculenta* are compared. Novocaine phenylpropionate and citrate usually diminish chronaxie, electrical resistance, and excitability, but increase rheobase, the former salt being 5—7 and the latter 0.1—0.125 times as active as the hydrochloride. Morphine citrate (I) and hydrochloride (II) decrease rheobase whereas the phenylpropionate (III), in concns. of 0.02—0.001N, increases it. (I) and (III) scarcely change the chronaxie whereas (II) increases it. Electrical resistance is decreased in each case as the concn. is increased from 0.001 to 0.02N, (III) being the most active. Excitability is increased and then decreased by (I) and (II) as the concn. increases from 0.001 to 0.02N, but is markedly decreased by (III). Under comparable conditions, (III) is 20—30 times and (I) 0.2—0.1 times as active as (II). J. L. D.

**Action of morphine sulphate on intestinal motility and its modification by atropine sulphate.**

M. A. KANAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 506—508).—Results of earlier workers are confirmed. P. G. M.

**Effects of morphine on blood-sugar and reflex activity in the chronic spinal cat.** R. C. BONO and C. M. BROOKS (J. Pharm. Exp. Ther., 1937, 61, 82—88).—A slight transient fall in blood-sugar followed by a rise above the initial val. occurs.

H. G. R.

**Effect of morphine injection on blood cells in normal individuals and in opium addicts.** C. L. CHENG and W. C. MA (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, 1, 659—673).

CH. ABS. (p)

**Action of tobacco smoke on the heart, blood pressure, and blood vessels.** T. GOTSEV (Arch. exp. Path. Pharm., 1937, 185, 553—565).—Tobacco smoke was breathed by dog, cat, and a lamb and changes of blood pressure and of the blood vessels of intestine, kidney, and spleen were simultaneously measured. The various changes of pressure obtained could also be observed when nicotine was injected intravenously.

P. W. C.

**Peripheral vaso-constrictor action of cytosine, a nicotine-like substance.** RAYMOND-HAMET (Compt. rend., 1937, 205, 393—395).—About 0.11 mg. per kg. of cytosine hydrochloride (I) injected into the renal artery (anastomosed with the femoral) of a dog under chloralose anaesthesia diminishes the venous outflow from the kidney. 5.6 mg. per kg. of (I) causes vasodilatation.

J. L. D.

**Pharmacology of convolvine.** J. K. NOLLE (Chim. Farm. Prom., 1934, No. 6, 35—37).—Convolvine, a powerful stimulant of the central nervous system, has a local anæsthetic action as persistent as that of cocaine.

CH. ABS. (p)

**Mechanism of the action of digitalis glucosides on muscle.** M. CATTELL and H. GOODSELL (Science, 1937, 86, 106—107).—Data for the change in K content of the frog's sartorius muscle occurring as a result of immersion for several hr. in a Ringer's solution of ouabain ( $1:5 \times 10^5$ ) are recorded. The average loss of K is 29%.

L. S. T.

**Action of therapeutic doses of digitalis and strophanthin on cat's heart injured by diphtheria toxin.** J. DIECKHOFF and E. SCHULZE (Arch. exp. Path. Pharm., 1937, 185, 418—427).—The conductivity of cat's heart in the heart-lung prep. injured by diphtheria toxin is increased by small doses of strophanthin. Digitalis improves the performance of such hearts but causes various secondary disturbances which react unfavourably on the heart conductivity.

P. W. C.

**Comparative investigation of the pharmacological activity of natural and synthetic derivatives of *k*-strophanthidin.** W. NEUMANN (Arch. exp. Path. Pharm., 1937, 185, 329—352).—The pharmacological action on frog's heart both isolated and *in vivo* of the glucosides *k*-strophanthin and cymar in and of 27 synthetic strophanthidin esters with unsubstituted, substituted, and hydroxylated fatty, aromatic, and fatty-aromatic acids is investigated. With some of these esters, the heart

action is as great as with the natural glucosides, especially so with esters of *iso*-fatty acids having 4—7-C chains. In esters with aromatic nuclei, the activity is increased on nitration. Introduction of alkyl and acetylation of OH-acids increased the activity. The time curves for the course of the reaction with the synthetic esters are very similar to those with glucosides. With rabbits, all these esters and also the glucosides showed greater activity than did the corresponding aglucones. In cats, however, this was true only of acetyl-*k*-strophanthidin.

P. W. C.

**Influence of extract of squill and scillaren on the bundle of His and the refractory phase of frog heart.** A. HALBSGUT (Klin. Woch., 1936, 15, 420—421; Chem. Zentr., 1936, i, 3716).—The heart-poison action is similar to that of digitalis glucosides, strophanthin, and antiarin.

H. N. R.

**Influence of acridine derivatives on the blood picture: relation to sterilising action.** Y. HIRAKA (J. Med. Coll. Keijo, 1935, 5, 338—349).—Administration of rivanol, trypanflavin (I), panseptin, or trypasol increased the no. of white cells. (I) showed the greatest sterilising action *in vitro*.

CH. ABS. (p)

(A) Absorption and excretion of atebtrin. (B) **Influence of food in the stomach.** N. D. KEHAR (Rec. Malaria Survey India, 1935, 5, 393—404, 405—411).—(A) Orally administered atebtrin (I) is eliminated, to the extent of 50—70%, relatively slowly in urine. Its protective action against malaria depends on prolonged retention in the tissues.

(B) Food delays the absorption of (I) and lowers the rate of elimination for 3 days following administration; in this period the muconate was excreted more readily than was the chloride. High-protein diets retard elimination of (I).

CH. ABS. (p)

**Toxicity of certain codeine compounds for male and female rats of different ages.** C. F. POE, J. G. STRONG, and N. F. WITT (J. Pharm. Exp. Ther., 1937, 61, 62—65).—The toxicity does not vary with the age or sex of the animal or with the type of salt used.

H. G. R.

**Toxicity of broomweed (*Gutierrezia microcephala*) for cattle, sheep, and goats.** F. P. MATHEWS (J. Amer. Vet. Med. Assoc., 1936, 41, 55—61).

CH. ABS. (p)

**Problem of possible systemic effects from certain chlorinated hydrocarbons.** C. K. DRINKER, M. F. WARREN, and G. A. BENNETT (J. Ind. Hyg., 1937, 19, 283—299).—Three fatal cases of industrial poisoning by the fumes of the higher chlorinated products of  $C_{10}H_8$  and  $Ph_2$  are described. Rats exposed to mixtures of  $C_{10}H_7Cl_5$  and  $C_{10}H_7Cl_6$  and to chlorinated  $Ph_2$  (Cl 64%), in concns. comparable with those met with in the air of industrial premises, develop no toxic symptoms during life, but when examined *post-mortem* show a certain degree of damage to the liver but to no other organs. Administration to these poisoned animals of doses of  $CCl_4$ , non-toxic to normal animals, produces yellow atrophy of the liver.  $C_{10}H_7Cl_3$  is much less toxic than the above higher chlorinated products.

The upper safe limit of concn. for the higher chlorinated products in air is 0.5 mg. per cu. m. whilst simultaneous presence of, *e.g.*,  $CCl_4$  should be avoided.

W. O. K.

**Comparative intravenous toxicity of some monohydric saturated alcohols.** A. J. LEHMAN and H. W. NEWMAN (J. Pharm. Exp. Ther., 1937, 61, 103—106).—The intravenous toxicities in rabbits (EtOH = 1) of MeOH, PrOH, Bu<sup>n</sup>OH, and *iso*amyl alcohol are 0.59, 2.33, 3.56, and 5.99, respectively.

H. G. R.

**Distribution of methyl alcohol in dogs after inhalation and administration by stomach tube and subcutaneously.** W. P. YANT and H. H. SCHRENK (J. Ind. Hyg., 1937, 19, 337—345).—The aq. fluids contain the highest, the tissues a lower, and the bone-marrow and adipose tissues the lowest [MeOH]. The ratio of MeOH to the  $H_2O$  content of the fluid or organ is approx. const. and independent of whether the animal is absorbing or losing MeOH or is in a steady state.

W. O. K.

**Carbon monoxide intoxication: relation to fatigue.** U. BASSI and C. SORESINA (Rass. med. appl. lav. ind., 1935, 6, 280—308).—Fatigued guinea-pigs had less resistance than rested animals to the action of illuminating gas (15% CO). When the toxic action of CO is prevalent there is an increase, and when fatigue is prevalent there is a decrease, in haemoglobin and globular val.

CH. ABS. (p)

**Influence of petrol vapours on the saturation of the blood by carbon monoxide.** H. W. BRONDUM and G. B. RAY (J. Ind. Hyg., 1937, 19, 320—322).—In cats under dial-urethane anaesthesia, the rate of saturation of the blood with CO following the respiration of air containing CO is not altered by the presence of petrol vapour. In cases of poisoning by motor exhaust fumes, the toxic effect of CO is probably not enhanced by the petrol vapour.

W. O. K.

**Calcium content of blood during experimental poisoning with sodium fluoride.** T. A. SCHTESSEL (J. Physiol. U.S.S.R., 1935, 19, 1239—1244).—Prolonged daily administration to dogs of 0.02 g. of NaF per kg. body-wt. did not change blood-Ca.

CH. ABS. (p)

**Resorption, distribution, and elimination of fluorides during the poisoning of an animal with sodium fluoride.** I. D. GADASKINA and T. A. SCHTESSEL (J. Physiol. U.S.S.R., 1935, 19, 1245—1257).—About 90% of the F<sup>-</sup> fed to dogs was retained. When NaF was injected intravenously, elimination occurred via kidneys and intestine. Oral administration of NaF resulted in increased blood-F only after 4—5 months; the F content of tissues was doubled and that of bones increased 5-fold in 3.5 months.

CH. ABS. (p)

**Health hazard of a group of workers exposed to alumina dust.** C. L. SUTHERLAND, A. MEIKLEJOHN, and F. N. R. PRICE (J. Ind. Hyg., 1937, 19, 312—319).—In 49 workers at an  $Al_2O_3$  dust, chemical and radiological examination failed to reveal any trace of pneumoconiosis or other pulmonary disease arising from the inhalation of the dust. No symptoms

attributable to the presence of traces of F in the atm. could be detected. The substitution of  $\text{Al}_2\text{O}_3$  for the flint used in the prep. of certain varieties of English bone china would seem likely to remove the serious risks involved in the use of the latter.

W. O. K.

**Sodium formaldehydesulphoxylate in experimental poisoning by mercuric chloride.** W. MODEL, H. GOLD, G. J. WINTHROP, and E. B. FOOT (J. Pharm. Exp. Ther., 1937, 61, 66—81).—Cats given the sulphoxylate (I) survive lethal oral or intravenous doses of  $\text{HgCl}_2$ , the degree of protection being greater in the former case but decreasing as the dose of  $\text{HgCl}_2$  or the interval between administration of the two drugs is increased. The end product of reduction of  $\text{HgCl}_2$  by (I) is toxic, especially by the intravenous route.

H. G. R.

**Effects of minute amounts of lead in the diet of the dog.** M. K. HORWITT and G. R. COWGILL (Proc. Soc. Exp. Biol. Med., 1937, 36, 744—746).—No pathological changes due to Pb poisoning in the tissues and no deposition of Pb in the bones were observed (X-ray) over a period of 7 months, with diets containing 27 and 102 mg. of Pb per kg. The Pb contents of blood and bone increased.

H. G. R.

**Toxicity and pathology of selenium.** M. I. SMITH, E. F. STOHLMAN, and R. D. LILLIE (J. Pharm. Exp. Ther., 1937, 60, 449—471).—The toxicity of Se in rats on intravenous injection is the same whether given as  $\text{SeO}_3$  or  $\text{SeO}_4$ , 3 mg. per kg. being fatal in about 50% of the cases. The oral min. lethal dose for the rabbit is the same, but  $\text{SeO}_3$  is more toxic on injection. There is a cumulative effect on continual administration of  $\text{SeO}_3$  and  $\text{SeO}_4$  in small doses, and although there is no acquired tolerance, much of it seems to be capable of detoxification. Rats are the most resistant, and cats the most susceptible, to Se poisoning.

J. N. A.

**Selenium poisoning in fish.** M. M. ELLIS, H. L. MOTLEY, M. D. ELLIS, and R. O. JONES (Proc. Soc. Exp. Biol. Med., 1937, 36, 519—522).—A single injection of 3 mg. per kg. of Se (as  $\text{Na}_2\text{SeO}_3$ ) is fatal in catfish within 48 hr. at  $10^\circ$ . The toxicity increases with rise in temp. Five daily injections of 0.05 mg. of Se produce exophthalmos. Blood-haemoglobin of poisoned fish (6.9) is < that of normal fish (9.8 g. per 100 c.c.); *d* is also lower. (Edema of the stomach is > that of other organs.

P. G. M.

**Toxicity of orally ingested arsenic, selenium, tellurium, vanadium, and molybdenum.** K. W. FRANKE and A. L. MOXON (J. Pharm. Exp. Ther., 1937, 61, 89—102).—When fed (as salts, e.g.,  $\text{Na}_2\text{HASO}_3$ ) to rats the order of toxicity is  $\text{As} < \text{Mo} < \text{Te} < \text{V} < \text{Se}$ . Only Se causes a disturbance of the hæmatopoietic function.

H. G. R.

**Asphyxiation and death in oxygen-deficient air.** E. J. POWERS (Amer. J. Publ. Health, 1937, 27, 880—882).—The lethal effect on men of air ( $\text{O}_2$  1.6,  $\text{CO}_2$  10.8%) in an oil tank due to fermentation of linseed-oil foots is reported. No toxic gases were present, death being due to asphyxiation. The ventilation of such tanks is advisable.

W. L. D.

**Chemical analysis and diagnosis of poisoning in the laboratory.** D. G. STEYN (J.S. African Vet. Med. Assoc., 1935, 6, 219—223).—Methods of taking and preparing samples are described. CH. ABS. (e)

**Use of different measures of reaction velocity in the study of the kinetics of biochemical reactions.** O. BODANSKY (J. Biol. Chem., 1937, 120, 555—574).—The kinetics of biochemical reactions are considered with reference to the representation of the rate of reaction by means of reaction consts., to the general relationships between the reaction const. and other criteria of reaction velocity, and to the conditions of applicability consequent to these relationships. The considerations are exemplified by data on reactions, e.g., hydrolysis of Na  $\beta$ -glycerophosphate by phosphatase, and by examination of generalisations of, e.g., the Schütz-Borissov law.

F. O. H.

**Role of nitrates in biological oxidations.** E. AUBEL (Enzymologia, 1937, 4, Part II, 51—52).—In dehydrogenations for which the only H acceptors are  $\text{O}_2$  and  $\text{NO}_3$ ,  $\text{NO}_3$  is converted into  $\text{NO}_2$  which oxidises leucomethylene-blue (I) or reduced flavin. Hence (I) is anaerobically oxidised by  $\text{NO}_3$  in presence of *B. coli* and H donor (e.g., lactate, glucose).

W. McC.

**Constitution of potato-oxidase.** F. KUBOWITZ (Biochem. Z., 1937, 292, 221—229).—The activity of the oxidase (I)  $\propto$  its Cu content but is not affected by added Cu. Manometric determinations are effected by successive oxidation of a system of (I), pyrocatechol, dihydropyridine (or triphosphopyridine nucleotide), and hexosemonophosphoric acid. Fractionation of (I) preps. with  $\text{COMe}_2$ ,  $(\text{NH}_4)_2\text{SO}_4$ ,  $\text{AgOAc}$ , etc. yields a Cu-protein complex (Cu 0.165, N approx. 15%; isoelectric point  $p_H$  5.4).

F. O. H.

**Effect of heavy water on enzymic dehydrogenation.** T. THUNBERG (Enzymologia, 1937, 3, 56—61).—The rate of decolorisation of methylene-blue in  $\text{H}_2\text{O}$  by meal from *Pisum sativum* dried with  $\text{COMe}_2$  is decreased by adding  $\text{D}_2\text{O}$ , the effect increasing with increasing  $[\text{D}_2\text{O}]$ . With pure  $\text{D}_2\text{O}$ , the rate is decreased 30%. In presence of  $\text{K}_2\text{HPO}_4$ , the decrease produced by  $\text{D}_2\text{O}$  is very slight. Glutamic acid increases the rate more in presence than in absence of  $\text{D}_2\text{O}$ , but *l*-malic acid in presence of  $\text{K}_2\text{HPO}_4$  produces equal rates in  $\text{H}_2\text{O}$  and  $\text{D}_2\text{O}$ .

W. McC.

**Mannitol dehydrogenase.** D. MULLER (Enzymologia, 1937, 3, 26—28).—Yeast extracts contain a sp. mannitol (I) dehydrogenase ( $\text{MeOH}$ ,  $\text{EtOH}$ , glycerol, erythritol, sorbitol, and dulcitol not attacked). Extracts of beans and of cucumber seeds contain  $\text{EtOH}$  dehydrogenase but not (I) dehydrogenase. (I) dehydrogenase is frequently or always accompanied by  $\text{EtOH}$  dehydrogenase.

W. McC.

**Dehydrogenation of pyruvic acid.** F. LIPMANN (Enzymologia, 1937, 4, Part II, 65—72).— $\text{AcCO}_2\text{H}$  is converted into  $\text{AcOH}$  and  $\text{CO}_2$  by the dehydrogenase (I) of dried material from *Bacterium Delbrückii*. There is no relation between the dehydrogenation and the dismutation of  $\text{AcCO}_2\text{H}$ . Dehydrogenation occurs only if free  $\text{PO}_4'''$  or  $\text{AsO}_4'''$  is present. The prosthetic

group of (I) is cocarboxylase, which occurs in animal tissues in amounts approx. equal to their vitamin- $B_1$  contents. W. McC.

**Components of dehydrogenase systems. XV.** Dehydrogenation of  $\alpha$ -glycerophosphoric acid in the animal body. H. VON EULER, E. ADLER, and G. GÜNTHER. **XVI.** Formic acid- and alcohol-dehydrogenase from seeds. E. ADLER and M. SREENIVASAYA (Z. physiol. Chem., 1937, 249, 1—15, 24—39; cf., this vol., 392).—XV. Animal organs (rat's muscle, kidney, liver, brain; rabbit's muscle) contain an  $\alpha$ -glycerophosphoric acid apodehydrogenase (I) the co-enzyme for which is cozymase (II). The muscles contain also Green's glycerophosphate-dehydrogenase (III) (A., 1936, 636) which probably requires no co-enzyme. The dihydrocozymase (IV) produced during the action of the (I) system is oxidised by the yellow enzyme (V). The (III) system does not reduce  $\text{AcCO}_2\text{H}$  but  $2\text{H}$  is transferred to the system  $\text{AcCO}_2\text{H}$ -lactic acid-dehydrogenase (VI) from (I), (II) and (IV) interacting alternately with (I) and (VI).

XVI. The sp. co-enzyme of  $\text{HCO}_2\text{H}$ -apodehydrogenase (VII) (from peas) is (II) which in the (VII) system is converted, probably irreversibly, into (IV); low concns. of KCN inhibit the action of (VII). The uptake of  $\text{O}_2$  by the (VII) system (optimum  $p_{\text{H}}$  5.5—6.0) is increased by (V) and still more by methylene-blue. (II) is also the sp. co-enzyme for the EtOH-dehydrogenase of peas, which closely resembles that of yeast. W. McC.

**Oxidation by fumarate of reduced yellow enzyme.** K. LAKI (Z. physiol. Chem., 1937, 249, 61—62).—Yellow enzyme reduced with  $\text{Na}_2\text{S}_2\text{O}_4$  is re-oxidised by fumaric acid in presence of succinic oxidase. W. McC.

**Amino-acids of the yellow enzyme.**—See A., II, 448.

**Role of the second carboxyl group in the enzymic hydrogenation of oxaloacetic acid.** K. LAKI (Z. physiol. Chem., 1937, 249, 57—60).—In suspensions of pigeon's breast muscle, oxaloacetic acid (I) takes up  $2\text{H}$  from hexose more rapidly than does  $\text{AcCO}_2\text{H}$  because the additional  $\text{CO}_2\text{H}$  of (I) facilitates adsorption of enzymes and possibly also favourably alters the mol. structure. W. McC.

**Fermentation producing mannitol.** M. SCHOEN and E. ERAS (Enzymologia, 1937, 4, Part II, 198—204).—The enzyme of Gayon and Dubourg (A., 1901, i, 784) attacks fructose (I) much more quickly than glucose (II) when the two sugars are present in solution. In neutral medium, (I) is converted into mannitol (III) and lactic acid (IV) with small amounts of AcOH. In acid medium (II) gives rise to (IV) and small amounts of AcOH, whilst in neutral medium the proportions of the two acids are reversed. (III) is formed only from (I), and solutions of (II) which have been brought to a potential comparable with that of (I) do not give mannitol. In a solution containing (II) and sorbose, the  $r_{\text{H}}$  of which has been lowered by cysteine, the enzyme produces, not sorbitol, but only (III). J. N. A.

**Spectrography of the reaction of catalase with ethyl hydrogen peroxide.** K. G. STERN (Enzymologia, 1937, 4, Part II, 145—147; cf. this vol., 220).—On adding  $\text{EtO}_2\text{H}$  to a catalase solution, the absorption band of the free enzyme at 622 m $\mu$ . disappears and a new absorption band at 570 m $\mu$ . appears. At a rate corresponding with that of the cleavage of the substrate by the enzyme, the new band fades and the original band of the free enzyme reappears. The unstable intermediate compound responsible for the new band has the properties postulated for an enzyme-substrate compound. A certain fraction of the enzyme may be destroyed in a secondary reaction. P. W. C.

**Mechanism of enzymic oxidative production of melanin from tyrosine.** O. FURTH and H. THALLMAYER (Enzymologia, 1937, 3, 96—100).—Tyrosine with  $(\text{NH}_4)_2\text{S}_2\text{O}_8$  or  $\text{K}_2\text{S}_2\text{O}_8$  in acid solution or with  $\text{K}_2\text{S}_2\text{O}_8$  in alkaline solution gives products richer in C and poorer in H. W. McC.

**Enzymic degradation of histamine.** I. S. EDLBACHER and A. ZELLER (Helv. Chim. Acta, 1937, 20, 717—726).—The enzymic fission of histamine (I) is an oxidative process in which one equiv. of N is liberated as  $\text{NH}_3$ . Analogous model experiments with ascorbic acid and Fe catalysis suggest that this N atom is derived from the nucleus but this is not yet established. A pigment is formed during fission of (I) and a ketone giving a well-characterised dinitrophenylhydrazone is produced; its constitution has not been established. H. W.

**Decarboxylation of *d*-lysine and *l*-aspartic acid.** A. I. VIRTANEN and T. LAINE (Enzymologia, 1937, 3, 266—270).—Living bacteria of certain strains of *B. coli* isolated from sewage and from rat and guinea-pig faeces decarboxylate *d*-lysine at optimum  $p_{\text{H}}$  7 forming cadaverine. Living legume bacteria decarboxylate *l*-aspartic acid also at  $p_{\text{H}}$  optimum 7 giving  $\beta$ -alanine. Both reactions are quant. A. L.

**Enzymic synthesis of cocarboxylase.** H. TAUBER (Science, 1937, 86, 180).—Details of the synthesis (yield approx. 100%) from vitamin- $B_1$  and orthophosphate (i) by an enzymic system of dried yeast freed from natural cocarboxylase, and (ii) by an enzyme of the duodenal mucosa of the pig, are given. L. S. T.

**Influence of nutritive conditions on the urea-forming enzymic complex of rat liver.** P. J. VAN DER LEE and A. GORTER (Enzymologia, 1937, 4, Part II, 129—136).—Variations in the ability of rat liver to form urea, observed over a period of 20 weeks, could not be ascribed either to experimental error or to seasonal variation. A close relationship exists between the activity of the urea-forming enzymic complex and the protein content of the diet. Ornithine was not present in the diet. P. W. C.

**Influence of carcinogenic substances on enzymic processes.** P. RONDONI and W. BELTRAMI (Enzymologia, 1937, 3, 252—257).—Treatment of the skin of rabbits with benzpyrene causes an increase in the lipase content and in the rate of autolysis as determined by the content of N not coagulated by  $\text{CCl}_3\text{CO}_2\text{H}$ . A. L.

**Action of pancreas lipase on  $\alpha\alpha$ -dioctoyl- $\beta$ -monopalmitin and  $\alpha\alpha$ -dipalmito- $\beta$ -mono-octoin.** C. ARTEM and C. ZUMMO (Enzymologia, 1937, 3, 231—234).—Pancreas lipase hydrolyses the glycerides at the  $\alpha$  and  $\beta$  positions with almost the same velocity.

A. L.

**Action of sodium salts of organic acids on pancreatic lipase.** E. TRIA (Enzymologia, 1937, 3, 12—15; cf. this vol., 311; Woodhouse, A., 1932, 1278).—Pancreatic lipase is not appreciably activated by NaOAc,  $\text{Pr}^{\text{C}}\text{CO}_2\text{Na}$ ,  $\text{Bu}^{\text{C}}\text{CO}_2\text{Na}$ , NaOBz,  $\text{Na}_2\text{C}_2\text{O}_4$ , Na tartrate, citrate, malonate, glutarate, suberate, azelate, or sebacate but is slightly activated by Na myristate, palmitate, and stearate, and greatly activated by Na oleate.

W. McC.

**The acetylcholine-choline-esterase system.** G. E. HALL and C. C. LUCAS (J. Pharm. Exp. Ther., 1937, 61, 10—20).—The esterase from sera of various species is probably sp. Wide variations in the activity of the sera towards different esters were observed within the species.

H. G. R.

**Choline-esterase in the central nervous system.** D. NACHMANSOHN (Nature, 1937, 140, 427).—A comparison of the rate of hydrolysis of acetylcholine (I) in the grey and white matter of the spinal cord of the dog shows that the concn. of choline-esterase (II) is 10—20 times greater in the grey matter. In the central nervous system, as in muscle, (II) is found in a high concn. in tissue that contains nerve endings, which suggests that it has for its function the rapid removal of (I), and that the grey matter acts as transmitter of nervous impulses in the central nervous system. In crustaceans (lobster), the concn. of (II) in the ganglion cells is  $>$  in the nerve fibre.

L. S. T.

**Choline-esterase activity of superior cervical ganglia.** D. GLICK (Nature, 1937, 140, 426—427).—Direct measurement by a micro-method shows that the max. choline-esterase activity of the superior cervical ganglion of the cat is, on the average, equiv. to the splitting of 0.10 mg. of acetylcholine chloride per sec. per mg. It is calc. that the time required to destroy the acetylcholine liberated by a nerve impulse is within the refractory period provided that enzyme and substrate are localised, at the nerve endings, within the ganglion cell.

L. S. T.

**Inhibitors of choline-esterase.** H. SOBOTKA and W. ANTROPOL (Enzymologia, 1937, 4, Part II, 189—191).—Various bile acids (I) inhibit to different extents. The effect is more sp. than their lytic power for blood cells or micro-organisms and cannot be duplicated by other surface-active substances: Bufotenine causes considerable inhibition  $>$  that produced by (I). Berberine produces complete inhibition, whilst snake-venom preps. from American *Crotalida* have only a slight action.

J. N. A.

**Choline-phosphatase and choline-esterase.** M. FRANCIOLI (Enzymologia, 1937, 3, 200—203).—Choline-phosphatase and choline-esterase, though both inactivated by eserine, are not identical.

A. L.

**Lecithinase A and B.** M. FRANCIOLI (Enzymologia, 1937, 3, 204—209).—The activity of lecithinase

A, but not that of lecithinase B, is inhibited by eserine. By the action of B from wasp venom on lecithin both acid groups are directly split off.

A. L.

**Effect of storage on the activity of papain.** R. R. THOMPSON (Ind. Eng. Chem., 1937, 29, 1047).—Storage of papain preps. results in a slow reversible inactivation (loss of SH groups) followed by a more gradual irreversible loss of proteolytic activity.

F. O. H.

**Bacterial proteases. VI. Protease system of Gorini's acidoproteolyte.** G. GORBACH (Enzymologia, 1937, 3, 65—74; cf. A., 1936, 524; this vol., 68).—Cultures of *Caseicoccus* and *Gastrococcus* yield a proteinase (I) of the papain type which exhibits optimal activity at  $p_H$  4.7 and is separated from the common bacterial proteinase (II) (optimal activity at  $p_H$  7) by dialysis, adsorption on kaolin- $\text{Fe}(\text{OH})_3$ , and elution with aq.  $(\text{NH}_4)_2\text{HPO}_4$ . Some preps. of (I) and (II) specifically attack gelatin or caseinogen. The  $p_H$ -activity curve of *Caseicoccus* peptidases exhibits max. at  $p_H$  4.8 and 7.0, that of *Gastrococcus* peptidases at  $p_H$  4.8 and 8.4, and that of *Enterococcus* peptidases at  $p_H$  4.8.

W. McC.

**Multiple nature of crystalline pepsin.** G. ÅGREN and E. HAMMARSTEN (Enzymologia, 1937, 4, Part II, 49—50).—The behaviour of cryst. pepsin (prepared by Northrop's method) in Theorell's cataborosis apparatus indicates that it consists of at least two proteins.

W. McC.

**Fission of glycylglutamic anhydride by crystalline trypsin.** Y. TAZAWA (Proc. Imp. Acad. Tokyo, 1937, 13, 272—276).—Purified trypsin (this vol., 141) (trypsin-A), on dialysis and cooling in  $\text{H}_2\text{O}$ -EtOH (2:1), gives cryst. trypsin-B, sol. in  $\text{H}_2\text{O}$  after swelling, dyed with partial decomp. by eosin, picric acid, or I, and giving Millon's and xanthoproteic reactions only feebly. Neither trypsin is autodigested at the optimal  $p_H$  in 24—48 hr. -B is stable to papain but not to pepsin, and is thus of protein nature; it hydrolyses glycyl-D-glutamic anhydride exactly as does -A, the reaction being unaffected by  $\text{NH}_2$ -acids, peptides, or neutral diketopiperazine, but hindered by proteins which possess more affinity for trypsin.

R. S. C.

**Influence of carbohydrates on proteolytic digestion *in vitro*.** P. C. HSU and W. H. ADOLPH (J. Chinese Chem. Soc., 1937, 5, 186—192).—Sol. carbohydrates, including mono- and di-saccharides and dextrin, do not influence the digestion of protein by pepsin or trypsin *in vitro*. Digestibility is measured in terms of the amount of N rendered sol. and in terms of tyrosine liberated. Boiled starch appears to adsorb the protein substrate; there is no evidence that it inhibits the enzymic process.

**Proteoclastic enzyme of wheat and barley.** N. P. KOZMINA and M. S. REZNITSCHENKO (Biochimia, 1937, 2, 630—637).—Wheat or barley grain extracts cause initial liquefaction of gelatin, without increase in the no. of free  $\text{NH}_2$ -groups, and this is followed by proteolytic action, with liberation of  $\text{NH}_2$ -acids, after the  $\eta$  has reached a min. val.

R. T.

**Selective absorption in the ultra-violet of solutions of the enzymes of the digestive tract.** L. KARCZAG and M. HANAK (*Enzymologia*, 1937, 4, Part II, 122—124).—The enzyme solutions can be divided into groups, one containing pepsin which gives an absorption spectrum similar to that of human gastric and duodenal juice (max. at 274 and min. at 248 m $\mu$ .), the other containing trypsin (max. at 260 and min. at 238 m $\mu$ .). The optical consts. are independent of the type of animal. P. W. C.

**Cellulase and other enzymes of the larvæ of *Stromatum fulvum*.** Villers. K. MANSOUR and J. J. MANSOUR-BEK (*Enzymologia*, 1937, 4, Part II, 1—6).—The gastric juice of the larvæ contains a cellulase which hydrolyses cellulose, lichenin, and lignocellulose equally rapidly, and exhibits optimal activity at  $p_H$  5.5—5.6. The juice also contains proteolytic enzymes. W. McC.

**Pectolase.** F. EHRLICH (*Enzymologia*, 1937, 3, 185—199).—Pectolase from *Penicillium Ehrlichii* hydrolyses pectolic acid in solution or gel to pectolactonic acid in neutral, and to *d*-galacturonic acid in acid, solution. For the latter reaction the optimum temp. is 55°. Hydrolysis is accompanied by a marked reduction in  $\eta$ , thus indicating a close relationship between the  $\eta$  of the substrates and their closed-chain structure. Pectolysis in plants is effected by the combined action of pectase and pectolase. The assumption of a protopectolase is unnecessary. A. L.

[Action of] amylases and glucosidases [on glucosides]. J. BLOM and B. BRAAE (*Enzymologia*, 1937, 4, Part II, 53—56; cf. A., 1936, 1096).—Maltose (I),  $\alpha$ -methylglucoside (II), sucrose (III), salicin (IV), and cellobiose (V) are not attacked by  $\alpha$ -amylase (VI) from bacteria.  $\beta$ -Amylase (VII) from ungerminated barley hydrolyses (IV) and (V) but not (I), (II), and (III). (VII) and  $\beta$ -glucosidase (VIII) but not (VI) and  $\alpha$ -glucosidase are stable at  $p_H$  3.5. The (VII) and (VIII) contents of ungerminated barley do not vary in parallel and (VII) and (VIII) differ in their resistance to destruction by heat. (V) is more rapidly hydrolysed by glucosidase from barley than is (IV). W. McC.

**Starch. II. Hydrolysis of starch paste by  $\beta$ -amylase.** A. TYCHOWSKI. **III. Hydrolysis of starch paste by heating under pressure.** A. TYCHOWSKI and S. MASIOR (*Biochem. Z.*, 1937, 291, 247—253, 399—405; cf. this vol., 312; Ling and Nanji, *J.C.S.*, 1923, 123, 2666).—II. The amylose (I) of starch paste is rapidly and quantitatively converted into maltose (II) by  $\beta$ -amylase (III) from non-germinated barley although  $\eta$  of the paste decreases very slowly. When the action is very prolonged, amylopectin (IV) is converted into (II) by the slow action of (III) or by  $\alpha$ -amylase present in small amount in (III). Separation of (I) and (IV) and the isolation of an active (II) prep. are effected by the action, at 20°, of (III) on the paste in which the ratio (I) : (IV) is 58 : 42.

III. Starch, heated with H<sub>2</sub>O for 10 hr., is hydrolysed by the H<sub>3</sub>PO<sub>4</sub> which is liberated, the extent of hydrolysis increasing with increase of temp. and acidity ( $p_H$  7.1—3.0). At <130°, sol.

starch is produced, at 130—150°, amounts of (II) which increase as temp. increases, and at >150°, glucose and amounts of (II) which decrease as temp. further increases. At >145°, decomp. products of carbohydrates are also produced. The amount of H<sub>3</sub>PO<sub>4</sub> liberated increases with increase of temp., being complete at approx. 160°. Small amounts of org. acids of high mol. wt. are also produced.

W. McC.

**Enzymic phosphorylation of starch.** P. OSTERN, J. A. GUTHKE, and B. UMSCHWEIF (*Enzymologia*, 1937, 3, 5—9; cf. A., 1936, 1546).—Dialysed extract of autolysed rabbit's muscle produces hexose-monophosphoric acid (I) (1 g. of Ba salt) from starch (II) (1 g.) and inorg. PO<sub>4</sub><sup>'''</sup> but not from mono-(glucose, fructose, galactose) or di-saccharides (maltose, sucrose, lactose, trehalose) and inorg. PO<sub>4</sub><sup>'''</sup>. At 37°, the yield of (I) is optimal in 4 hr., 83% of (II) being converted into (I). (II) is as rapidly phosphorylated as is glycogen. When the period of incubation is prolonged, hydrolysis of (I) occurs, hexose and H<sub>3</sub>PO<sub>4</sub> being produced.

W. McC.

**Difference in structure of starch determined by the diastatic method.** N. N. IVANOV, M. M. KURGATNIKOV, and V. A. KIRSANOVA (*Enzymologia*, 1937, 4, Part II, 163—168).—There is no perceptible difference in the rates of hydrolysis of various starch (I) preps. from the same type of barley by diastase under various conditions. (I) of the round pea is hydrolysed half as fast as (I) from the marrow pea. (I) obtained from peas grown under dry and hot conditions is hydrolysed much more slowly than (I) prepared from peas grown under moist conditions.

J. N. A.

**Rate of penetration of sugars introduced by infiltration to the sites of enzymic transformation in cells.** A. KURANOV and N. KRIUKOVA (*Biochimia*, 1937, 2, 674—686).—Aq. sucrose (I) is infiltrated into cyclamen leaves, followed after varying times by yeast invertase, which hydrolyses (I) remaining in the pericellular fluid. The rate of penetration of (I) into the cells is thrice that of inversion by intracellular invertase. Infiltration with 0.1M-KCl before introduction of (I) slightly lowers the rate of hydrolysis, and increases the rate of synthesis of starch; 0.1M-CaCl<sub>2</sub> has no effect on the latter, but strongly inhibits the former, process. The rate of synthesis of starch from maltose in hortensia leaves is lowered by CaCl<sub>2</sub>, to an extent > that from glucose. R. T.

**Direction of enzyme action as an index of the drought-resisting properties of cultivated plants. I. Action of invertase in drought-resistant and non-resistant varieties of wheat.** N. M. SISAKJAN (*Biochimia*, 1937, 2, 687—699).—With lowering of environmental humidity the invertase action of leaves of different wheat varieties becomes predominately hydrolytic, to a greater extent in non-resistant than in drought-resistant varieties.

R. T.

**Synthetic and hydrolytic actions of invertase in living plants.** A. I. OPARIN (*Enzymologia*, 1937, 4, Part II, 13—23).—Invertase (I) occurs free

and combined in plants, the free form having hydrolytic, the combined form synthetic, properties. Since the ratio free (I) : combined (I) varies greatly according to the species of plant concerned and since the ratio is altered by various factors (e.g.,  $H_2O$  content, stage of development, temp., action of narcotics) the ratio hexose : sucrose likewise varies greatly. Sugar beet contains considerable amounts of (I), most of which is combined. W. McC.

**Inhibition by glyceraldehyde of glycolytic degradation of carbohydrates.** E. ADLER, F. CALVET, and G. GUNTHER (Z. physiol. Chem., 1937, 249, 40—56; cf. this vol., 270).—Glyceraldehyde (I) inhibits lactic acid (II) production from glycogen (III) in dialysed extract of rat's muscle and from glucose (IV) or (III) in cell-free brain extract and sliced Jensen sarcoma and prevents fermentation of (IV) by apozymase + cozymase, but does not affect (II) production from hexose monophosphate (V) in muscle extract or from (V) or hexose diphosphate (VI) in brain extract or sliced sarcoma. (I) does not affect the transfer by hexose phosphorylase (from yeast) of  $PO_4'''$  from adenosine triphosphate to (IV) or the reversible transformation of (VI) into  $AcCO_2H$  in brain extract or sliced sarcoma in presence of  $NaF$ . W. McC.

**Magnesium activation of tissue phosphatases.** K. V. GIRI (Proc. Soc. Biol. Chem. India, 1937, 2, 10).—Mg activation of kidney, liver, and brain phosphatases is influenced by the duration of extraction and age of the prep. It is increased on purification of the extracts by ultrafiltration. L. D. G.

**Non-osseous origins of serum phosphatase : the liver.** A. BODANSKY (Enzymologia, 1937, 3, 258—260).—Disturbances of liver function in dogs due to various substances caused increases in serum-phosphatase. This increase was, in certain cases only, associated with a rise in serum-bilirubin. Serum-cholesterol increased in some cases but decreased in others. A. L.

**Hydrolysis of glucosides by sweet almond emulsin.**—See A., II, 445.

**Role of proteoflavin in the electrochemical equilibrium of cells.** R. WURMSER and S. FILITTI-WURMSER (Enzymologia, 1937, 4, Part II, 137—138).—The potential of an oxidised Lebedev's extract varies in function of time and the resulting curve is characterised by a plateau situated at  $-0.07$  v. at  $p_H$  7 and temp.  $25^\circ$ . The length of the plateau is very greatly increased by adding proteoflavin to the extract, suggesting that alloxazine compounds may play a role in the oxidation-reduction equilibria of the living cells. P. W. C.

**Enzymic hydrogenation of dehydrodeoxycholic acid by yeast.** C. H. KIM (Enzymologia, 1937, 4, Part II, 119—121).—Dehydrodeoxycholic acid, added to a bottom-yeast fermentation of glucose- $NaHSO_3$ , acts as a H acceptor in the same way as does  $MeCHO$  and is reduced to  $\alpha$ -3-hydroxy-12-ketocholanic acid. P. W. C.

**Significance of phosphoglyceric acid production in living yeast.** S. RAPOPORT (Enzymologia,

1937, 3, 52—55).—Living yeast (brewers' and bakers') in  $H_2O$  or aq.  $PO_4'''$  produces phosphoglyceric acid (I) from sugar. (I) reaches its max. concn. rapidly and disappears rapidly when fermentation ceases. When brewers' yeast poisoned with  $PhMe$  is used, the (I) concn. attained is much greater. Possibly the production of (I) is a self-regulating process involving an unknown H activator. W. McC.

**Carboligase and the optical properties of the reaction product.** Y. TOMIYASU (Biochem. Z., 1937, 292, 234—240; cf. this vol., 97).—*l*-Acetoin produced from  $MeCHO$  by various yeasts has  $[\alpha]_D -40^\circ$  and by bacteria  $-66^\circ$  to  $-98^\circ$ . With *Bacillus lactis aërogenes*, racemisation occurs to an extent dependent on  $p_H$  and condition of the bacilli. With yeasts,  $[\alpha]$  is independent of the presence of yeast-cells or sugar. F. O. H.

**Fermentation of maltosecarboxylic acid and melibiononic acid.** I. NEUBERG-RABINOWITSCH (Enzymologia, 1937, 3, 41—43).—The acids are fermented by maceration-juice from bottom yeast but not by the fresh yeast itself. Maltose and melibiose are hydrolysed to hexoses by fresh yeast in presence of  $PhMe$ . W. McC.

**Trehalose and yeast.** III. K. MYRBACK and B. ÖRTENBLAD (Biochem. Z., 1937, 292, 230—233; cf. this vol., 314).—During the fermentation of trehalose by yeast, the principal phosphoric ester produced is hexosediphosphoric acid. F. O. H.

**Fermentation of dextrans, starch, and disaccharides.** K. MYRBACK, B. ÖRTENBLAD, and K. AHLBORG (Enzymologia, 1937, 3, 210—219).—Dried yeasts are able to ferment ordinary starch, sol. starch, and other substances, e.g., dextrans, which are not attacked by amylases. Inhibition of the fermentation by  $NaF$  does not affect the hydrolysis of the polysaccharides. By suitable treatment of the yeast the ability to attack polysaccharides is lost, although such preps. can still ferment glucose. Probably the fermentation of the polysaccharides can take place only after hydrolysis. A. L.

**Effect of various dyes on fermentation and phosphate synthesis by yeast extract.** L. MICHAELIS, V. MORAGUES-GONZALEZ, and C. V. SMYTHE (Enzymologia, 1937, 3, 242—251).—The effect of 21 dyes on fermentation by yeast extract is given. Certain dyes prevented the fermentation of glucose, but did not inhibit that of hexose diphosphate, which was accompanied by a synthesis of org.  $PO_4'''$ . No relation between chemical structure and this effect is observed. A. L.

**Metabolism of pathogenic yeasts.** T. E. FRIEDEMANN and E. E. STENHOUSE (Proc. Soc. Exp. Biol. Med., 1937, 36, 750—752).—In buffered peptone-meat extract medium with 5% of glucose the principal products were  $EtOH$  and  $CO_2$ , the yield being identical with that of non-pathogenic yeasts. H. G. R.

**Mechanism of cellular death at high pressure. Compression of yeast in sodium chloride solutions.** B. J. LUYET and E. L. HODAPP (Proc. Soc. Exp. Biol. Med., 1937, 36, 615—617).—The injurious

effect of pressure is increased in aq. NaCl, there being a min. val. at approx. 1.17% NaCl. H. G. R.

**Glycocholate in yeast.** K. TAKAHASHI (Enzymologia, 1937, 3, 261—262).—Bottom yeast is capable of hydrolysing glycocholic acid. A. L.

**Action of the components of aneurin on yeasts (*Rhodotorula rubra* and *R. flava*).** W. H. SCHOPFER (Compt. rend., 1937, 205, 445—447).—The growth of these species in culture media is unaffected by bios I or II, whereas that of *Saccharomyces cerevisiae* is greatly accelerated by bios I + II. Vitamin- $B_1$  and its pyrimidine moiety greatly accelerate the growth of *R. rubra* and *R. flava*; the thiazole moiety has no action on the former, but slightly accelerates the growth of the latter. J. L. D.

**Use of yeast as human food. I. Essential amino-acids of yeast.** H. KRAUT and F. SCHLOTTMANN (Biochem. Z., 1937, 291, 406—414).—Of the N of yeast, the following % most probably occur as arginine, histidine, lysine, cystine, tryptophan, and tyrosine, respectively: 11.0, 3.0, 11.4, 1.6, 0.9, 2.5. W. McC.

**Preparation of fat by means of micro-organisms, with special reference to the work of the Institute of Industrial Fermentation. III. Preparation of fat using *Endomyces vernalis*. IV. Experiments with other organisms.** H. FINK, H. HAEHN, and W. HOERBURGER (Chem.-Ztg., 1937, 61, 723—726, 744—747; cf. this vol., 181).—With *E. vernalis* under suitable conditions, 30% of the sugar utilised reappears as fat, the possible production of some fat from nutrient protein being undecided. Using dil. molasses the yield is approx. 1/3 of that obtained with optimal nutrients. *P. javanicum* gave only 5.7% of fat with considerable amounts of citric acid. *Oidium lactis* on a whey medium to which are added 100 g. of sugar and  $(\text{NH}_4)_2\text{SO}_4$ , KCl, and  $\text{MgSO}_4$  gave in 5 days 12.5—14.34 g. of fat. P. W. C.

**Extent of proteolysis by enzymes of moulds and bacteria.** J. BERGER, M. J. JOHNSON, and W. H. PETERSON (Enzymologia, 1937, 4, Part II, 31—35).—At 37° and  $p_H$  5.5 or 7.0 the enzymes of *Aspergillus parasiticus* and *A. alliaceus* hydrolyse gelatin (I), caseinogen (II), edestin, lactalbumin, and ovalbumin to the extent of 82—100%. The rate and extent of hydrolysis of (I) by *A. alliaceus* decrease as (I) concn. increases from 0.5 to 14.3%. No increase in rate or extent is brought about by diminishing greatly (I) and enzyme concn. or by treating (I) successively with the enzymes of the two moulds. (I) and (II) are hydrolysed to the extent of 72 and 97% respectively by the enzymes of *B. megatherium*. W. McC.

**Physiological degeneration and regeneration of moulds producing citric acid.** T. CHRZASZCZ and M. ZAKOMORNY (Biochem. Z., 1937, 291, 312—324).—Moulds propagated for long periods frequently undergo spontaneous degeneration, those strains of *Aspergillus niger* which produce citric acid (I) losing much of their power to do so and producing instead increased amounts of  $\text{H}_2\text{C}_2\text{O}_4$ . Degenerated strains temporarily recover part of their (I)-producing power when grown on soil containing sucrose or glucose.

In strains producing much (I) before degeneration the power is restored to or above its original level by long-continued (approx. 1 year) growth, with frequent transfer to fresh portions of medium, on malt wort containing peptone or guanidine (II) or on other liquid media containing material favourable (urea is unfavourable) to regeneration. Accumulation of  $\text{H}_2\text{C}_2\text{O}_4$  occurs when the medium contains (II) or urea. W. McC.

**Effect of ascorbic acid (vitamin-C) on the pigmentation of the mycelium of *Aspergillus niger* deficient in magnesium, and on the development of this fungus.** J. LAVOLLAY and F. LABOREY (Compt. rend., 1937, 205, 179—180).—When the  $[\text{Mg}^{++}]$  in the culture medium is 0.42 mg. per 100 c.c., pigmentation of the mycelium is greatest. It is nearly abolished by 4 mg. of ascorbic acid (I) per 100 c.c., less pigment being formed. (I) increases the yield of mycelium for a given  $[\text{Mg}]$  (cf. this vol., 396) but not to the same extent for different  $[\text{Mg}]$ . Germination and sporulation are accelerated by (I), which may act as an auxiliary H carrier to vitamin- $B_2$  which is normally present. J. L. D.

**Production of *d*-mannitol from glycerol by moulds of the *Aspergillus glaucus* group. I.** I. YAMASAKI and M. SIMOMURA (Biochem. Z., 1937, 291, 240—248).—*A. glaucus* cultivated at 16—30° converts 20—30% of the glycerol (I), present as sole C source, into *d*-mannitol, max. yield being obtained with (I) concn. of 5—10 vol.-% and  $p_H$  7.0. W. McC.

**Action of organic acids on growth of moulds.** R. G. TOMKINS (Rep. Food Invest. Bd., 1936, 147—149).—The inhibition of growth of *Botrytis cinerea* by citric acid is due (a) to increase in  $[\text{H}^+]$  and (b) to a sp. effect of the citrate ion. The undissociated acid appears to favour rather than to retard growth. The malate, maleate, lactate, oxalate, and tartrate ions do not inhibit growth. E. C. S.

**Growth of *Penicillium carminoviolaceum*, Biourge, in media containing ethyl and other alcohols: production of pigment.** L. KRAUSE and M. ELLIS (Ann. Bot., 1937, 1, 499—513).—The inhibitory action of various concns. of EtOH on the growth, sporulation, and germination of spores is examined. At concns. < the inhibitory level, EtOH is utilised by the mould in the absence of adequate supplies of more favourable C sources. The inhibitory action of EtOH is > that of MeOH. The toxicity of other alcohols of the series increases with their mol. wt. The mould produces at least two pigments. A. G. P.

**Intermediates of vitamin- $B_1$  and growth of *Phycomyces*.** W. J. ROBBINS and F. KAVANAGH (Proc. Nat. Acad. Sci., 1937, 23, 499—502; cf. this vol., 242).—*P. Blakesleeanus* requires vitamin- $B_1$  for its growth but a mixture of 6-amino-2-methyl-5-bromomethylpyrimidine (I) and 4-methyl-5-hydroxyethylthiazole (II) is equally effective. Substitutes for (I) and (II) gave negative results. E. M. W.

**Growth factors for *Phycomyces*.** H. M. SINCLAIR (Nature, 1937, 140, 361).—With *Phycomyces* in a medium of glucose, asparagine, and inorg. salts

no growth is obtained when synthetic 6-amino-2-methyl-5-aminomethylpyrimidine hydrochloride (I), 4-methyl-5- $\beta$ -hydroxyethylthiazole (II), or the corresponding 5-thioformylamino- (III) or 6-hydroxy-5-thioformylamino-compounds (IV) are added singly. (I) and (II) together give a large growth, (II) and (III) a fair growth, and (II) and (IV) none. A neutral solution of vitamin- $B_1$ , after destruction by autoclaving for 2 hr. at 125°, still acts as a growth factor. The activity of (I) and (III) is not destroyed by this treatment, even in presence of 0.1N-NaOH;  $H_2O_2$  destroys the activity. This supports Schopfer's view that his alternative factor "*MP*" consists of the degradation products of  $-B_1$ .  $-B_1$  diphosphate is approx. as active as  $-B_1$ . L. S. T.

**Chemotherapy of infectious diseases.** M. OESTERLIN (Z. Hyg., 1936, 118, 263—306).—The chemotherapeutic action of substances is related to their optical activity, optical isomerides behaving differently toward trypanosomes. The toxicity of acridine (I) and quinoline (II) derivatives is related to their fluorescence, the character of which is modified by fixation in the affected cell which is a necessary factor in their toxic action. Broad emission bands are associated with high toxicity. Substances exhibiting fluorescence but having no combining capacity with the trypanosome cell have no therapeutic action. In (I) and (II) trypanocides the NV acts as the haptophore. Conversion of Rivanol (inactive) into the methosulphate causes acquisition of trypanocidal activity. Chemotherapeutic interference of isomeric styrylquinolines depends on the combination of the inactive substance with the receptor substance of the trypanosome with consequent inhibition of the sp. combination of the active trypanocide. Interference phenomena with arsinic acid, (I), and (II) compounds suggests that these substances are all fixed by the same cell constituent. Trypaflavin-paraflavins (III) interference depends on (III), with which fluorescence is associated. (III) interferes with the action of all similar fluorescent substances. No interference between (III) and arsinic acid occurs since different haptophores are concerned. A. G. P.

**Nutrition of flagellate Tetramitidae.** Sterols as growth-factors for trichomonads. II. R. CAILLEAU (Ann. Inst. Pasteur, 1937, 59, 293—328; cf. this vol., 224).—The growth-promoting activities of 67 sterols for *Trichomonas columbae* are determined and the relationship with structure is discussed. Nutritive sugars etc. for some *Tetramitidae* are tabulated. F. O. H.

**Electrophoresis and conductivity of bacterial suspensions.** R. SEIGNEURIN (Rev. Microbiol. Appl., 1937, 3, 1—13).—Curves relating to conductivity,  $p_H$ , and rate of electrophoresis are given. The charge on individual bacteria depends on the nature of the organism and on the concn. of the suspension. Possible application of electrical measurements to the differentiation of species or strains is discussed. L. D. G.

**Strains of *Bacillus radicola* from root nodules of soya bean.** C. H. WU (Rept. Inst. Sci. Res.

Manchoukuo, 1937, 1, 139—153).—Manchurian strains are examined. Crystal-violet (1/50,000—1/100,000) aids in isolation. Optimum  $p_H$  for media is 6.55; mannitol is the most suitable C source.

L. D. G.

**Mechanism of symbiotic nitrogen fixation. II. The  $pO_2$  function.** P. W. WILSON and E. B. FRED (Proc. Nat. Acad. Sci., 1937, 23, 503—508; cf. A., 1936, 1164).— $O_2$  is not directly concerned in the symbiotic N fixation process of red clover, since the  $pO_2$  function is essentially the same for the assimilation of both free and combined N. The process is inhibited by  $H_2$ . E. M. W.

**[Bacterial] formation of esters of ethyl alcohol.** L. ESPIL, L. GENEVOIS, E. PEYNAUD, and J. RIBEREAU-GAYON (Enzymologia, 1937, 4, Part II, 88—93).—A method is described for determining neutral esters by cold extraction with light petroleum. The rate of esterification under various conditions is examined. Acetic acid bacteria and yeasts esterify AcOH but not malic or tartaric acids. The latter acids are esterified only by a slow chemical reaction, the equilibrium of which is not attained even in 30 years. Bacterial esterification is reversible. P. W. C.

**Sugar alcohols. VIII. Oxidative specificity of *Acetobacter suboxydans*.** K. P. DOZOIS, C. J. CARR, and J. C. KRANTZ, jun., (Proc. Soc. Exp. Biol. Med., 1937, 36, 564—566).—*A. suboxydans* shows an oxidative specificity for glycerol. P. G. M.

**Dissimilation of phosphoric esters by propionic acid bacteria.** C. H. WERKMAN, R. W. STONE, and H. G. WOOD (Enzymologia, 1937, 4, Part II, 24—30).—Proliferating *Propionibacterium pentosaceum* degrades phosphoglyceric acid (I), hexose diphosphate (II), and  $\alpha$ -glycerophosphate (III) and, more readily, glucose (IV). 0.02M-NaF prevents or greatly restricts the degradation of (I), (II), and (III) but not the growth of the bacteria in presence of yeast extract or their power normally to ferment (IV). Possibly (I) is not invariably an intermediate in bacterial glycolysis. W. McC.

**Respiration and fermentation of *Propionibacterium pentosaceum*.** C. FROMAGEOT and P. CHAIX (Enzymologia, 1937, 3, 288—300).—The enzymic mechanism responsible for glucose fermentation in living propionic bacteria is inactivated by oxidation, although small amounts of S compounds have a protecting effect (A., 1935, 248). The lactic acid-fermenting system in the bacteria is less sensitive to oxidation, and that of  $AcCO_2H$  is unaffected.

A. L.

**Acetone-butyl alcohol fermentation.** E. SIMON and C. WEIZMANN (Enzymologia, 1937, 4, Part II, 169—188).—*Clostridium acetobutylicum* contains an enzyme system which reduces  $EtCO_2H$  and  $PrCO_2H$  to  $PrOH$  and  $BuOH$ , respectively. Succinic and malonic acids are not attacked, whilst the  $Et_1$  esters of succinic and adipic acids are only hydrolysed. The aldol condensate of  $AcCO_2H$  (de Jong, A., 1901, i, 446) is toxic and inhibits the fermentation. Enzymic prep. free from living cells could not be prepared.  $CH_2I \cdot CO_2H$ , salicylic acid,  $PhMe$ ,  $CHCl_3$ , trimethyl- $\beta$ -ethylhexylammonium iodide, NaF, and KCN are

inhibitors, whilst urethane and CO have no action. Addition of  $\text{CaCO}_3$  to the fermentation decreases the yield of neutral products, but this effect could be counteracted by addition of aq. yeast extract. The data indicate that  $\text{PrCO}_2\text{H}$  is not an intermediary in the fermentation. J. N. A.

**Acetoin formation in the acetone-butyl alcohol fermentation.** I. YAMASAKI and T. KARASIMA (Enzymologia, 1937, 3, 271—280).—During the fermentation of starch by *Bac. granulobacter pectinovorum* acetoin (I) is formed, and at the optimum temp. (25°) its formation runs parallel to that of  $\text{COMe}_2$  and  $\text{BuOH}$ . (I) is only an intermediate product in the metabolism and probably arises by the condensation of two mols. of  $\text{MeCHO}$ . A. L.

**Fermentation of rhamnose.** A. J. KLUYVER and C. SCHNELLEN (Enzymologia, 1937, 4, Part II, 7—12, cf. Castellani, A., 1931, 1334).—*Bacterium rhamnosifermentans* decomposes rhamnose (I) with production of propylene glycol [1 mol. per mol. of (I)],  $\text{HCO}_2\text{H}$ ,  $\text{AcOH}$ , and succinic acid. Equimol. amounts of  $\text{CO}_2$  and  $\text{H}_2$  are also produced. A possible mechanism for the degradation is suggested. W. McC.

**Factors limiting bacterial growth.** I. A. D. HERSHEY and J. BRONFENBRENNER (Proc. Soc. Exp. Biol. Med., 1937, 36, 556—561).—Under normal conditions the rates of growth and respiration of *B. coli* are limited by the rate at which  $\text{O}_2$  can reach the cells, but if excess of  $\text{O}_2$  is available growth soon ceases owing to oxidative removal of foodstuffs. P. G. M.

**Detection of factors which influence the multiplication of aerobic micro-organisms.** J. HIRSCH (Enzymologia, 1937, 4, Part II, 94—106).—Proliferation of *B. coli* is followed by manometric determination of respiration rates in a Barcroft-Warburg apparatus and the effect of temp., nutritive substances, and sowing on the growth curves is investigated in all phases of growth. P. W. C.

**Bacterium pyocyaneum and drinking waters.** A. ROCHAIX and G. VIEUX (Rev. Microbiol. Appl., 1937, 3, 14—17).—A virulent strain was detected in water free from *B. coli* and  $\text{H}_2\text{S}$ -producing bacteria. Antagonism towards other species occurs under certain conditions. *B. pyocyaneum* should be regarded as an index of contamination, and may possibly lead to human infection. L. D. G.

**Production of proteinase by gelatin-liquefying bacteria.** A. I. VIRTANEN and O. SUOLARTI (Enzymologia, 1937, 3, 62—64).—A reply to Gorbach and Pirch (this vol., 312). W. McC.

**Bacteriology of the hen's egg.** R. B. HAINES (Rep. Food Invest. Bd., 1936, 59—65).—*Pseudomonas* species were present in almost all the rots encountered, and form the majority of the organisms present in green rot. Red rot was also, in some instances, due to a *Pseudomonas*. Organisms similar to *Proteus melanogenes* produced a rapid and complete black rot at 20°. E. C. S.

**Luminescence of bacteria.** III. Further data regarding spectra connected with bioluminescence. J. G. EYMERS and K. L. VAN SCHOUWEN-

BURG (Enzymologia, 1937, 3, 235—241; cf. A., 1936, 1301).—The spectral composition of the light emitted by *N-d-glucosido-2:3-dihydronicotinamide* and its  $\text{Ac}_4$  derivative is the same. Data are also given for the spectra of the luminescence of *Cypridina* powder, lactoflavin, the oxidation product of aneurin with  $\text{K}_3\text{Fe}(\text{CN})_6$ , and *Pseudomonas putida*. A. L.

**Media containing ascorbic acid for anaerobic bacilli.** O. EHRLSMANN (Z. Hyg., 1936, 118, 544—554).—Ascorbic acid favours the growth of obligate anaerobes and, like cystine, makes possible the growth of these organisms in the presence of  $\text{O}_2$ . A. G. P.

**Substitution of  $\beta$ -alanine, nicotinic acid, and pimelic acid for meat extract in growth of diphtheria bacillus.** J. H. MUELLER (Proc. Soc. Exp. Biol. Med., 1937, 36, 706—708).—Small quantities of  $\beta$ -alanine, nicotinic and pimelic (I) acids allow  $\frac{2}{3}$  of the max. growth of the bacillus from whole tissue extracts when added to a suitable control medium. (I) appears to be the least essential (cf. this vol., 319). H. G. R.

**Diphtheria toxin. I. Isolation and characterisation of a toxic protein from filtrates of *Corynebacterium diphtheriae*.** A. M. PAPPENHEIMER, jun. (J. Biol. Chem., 1937, 120, 543—553).—Treatment of normal toxin preps. with  $(\text{NH}_4)_2\text{SO}_4$ ,  $\text{Al}_2\text{O}_3$ , dialysis, etc. affords a heat-coagulable protein (N 16, S 0.75, tyrosine 9, tryptophan 1.4%;  $[\alpha]_D$  approx.  $-40^\circ$  in  $\text{H}_2\text{O}$ ; isoelectric point  $p_H$  4.1; mol. wt. probably about 17,000) which is readily denatured at  $p_H < 6$  and moderate temp. and is lethal in 5 days to guinea-pigs (body-wt. 250 g.) in doses of approx.  $1 \times 10^{-4}$  mg. F. O. H.

**Bactericidal and virulence-diminishing action of saliva on *Pneumococcus*.** K. L. PESCH and R. DAMM (Z. Hyg., 1936, 118, 1—16).—Saliva contains a substance inhibitory to pneumococci. Its activity is diminished by passage through a Seitz filter and to a smaller extent by heating to  $56^\circ$ , and at body temp. is  $>$  at room temp. A. G. P.

**Significance of ammonia-containing nutrients for type-classification of the *Salmonella* group.** F. KAUFFMANN (Z. Hyg., 1936, 118, 425—428).—The  $\text{NH}_3$  method for differentiating between types of this group of bacteria is impracticable. A. G. P.

**Influence of contaminating bacteria on results of the microscopic test for streptococcal mastitis.** C. S. BRYAN and E. A. NELSON (Amer. J. Publ. Health, 1937, 27, 914—917).—*Escherichia coli*, *Bacillus subtilis*, and *Staphylococcus aureus* decrease the accuracy of the direct microscopic test in that order. *Brucella abortus* and other types not interfering with the reproduction of streptococci have no effect. The addition of 0.002% of brilliant-green inhibits these organisms. W. L. D.

**Antistreptococcal substances. Activity and toxicity of substances derived from benzene-sulphonamide.** R. L. MAYER and C. OEBCHSLIN (Compt. rend., 1937, 205, 181—182).—Oxidised forms of substances known to have antistreptococcal activity *in vivo* are tested.  $p\text{-NO}_2\text{-C}_6\text{H}_4\text{-SO}_2\text{-NH}_2$  (I) has  $>5$  times the activity of the  $p\text{-NH}_2$ -compound.  $p\text{-NO-C}_6\text{H}_4\text{-SO}_2\text{-NH}_2$  is the most active of the inter-

mediate reduction products of (I). The hydrazo- and hydrazino-derivatives are nearly inactive; the azoxy- and hydroxylamino- (II) -compounds are as active as the  $\cdot\text{NH}\cdot\text{CH}_2\text{Ph}$ -compound. *In vitro*, (II) has the greatest activity; the  $\text{NH}_2$ -compound has slight activity, whilst the others are almost inactive.

J. L. D.

**Preparation of infusion fluids.** C. TUI, K. L. McCLOSKEY, M. SCHRIFT, and A. L. YATES (J. Amer. Med. Assoc., 1937, 109, 250—252).—The "pyrogen" (I) responsible for febrile reactions occasionally following infusions is a bacterial product which appears in distilled  $\text{H}_2\text{O}$  kept in an unsterile vessel. (I) is particulate and appears to have a diameter between 50  $\mu$  and 1  $\mu$ . For its removal in practice an absorptive filtration through compressed asbestos fibre is recommended to precede sterilisation.

R. M. M. O.

**Determination of ultra-violet light absorption by certain bacteriophages.** L. A. SANDHOLZER, M. M. MANN, and G. P. BERRY (Science, 1937, 86, 104—105).—Absorption by three bacteriophages, C13, C16, and C36, prepared with a strain of *Escherichia communior* has been determined. Each prep. gave a characteristic  $\lambda$ -photographic density curve.

L. S. T.

**Inactivation of bacteriophage by ethyl alcohol.** C. A. COLWELL (Proc. Soc. Exp. Biol. Med., 1937, 36, 760—761).—Purified phage is more resistant than crude broth phage to inactivation by EtOH.

H. G. R.

**$p_{\text{H}}$  stability of Shope papilloma virus and purified papilloma virus protein.** R. W. G. WYCKOFF and J. W. BEARD (Proc. Soc. Exp. Biol. Med., 1937, 36, 562—563).—The virus activity remains high on the acid side of  $p_{\text{H}}$  7 but is suddenly lost at  $p_{\text{H}}$  2.9—3.3. Above  $p_{\text{H}}$  10.1 virus solutions immediately become non-infectious, whilst in the range 7.0—10.1 the titre of the solutions gradually diminishes.

P. G. M.

**Latent virus of lily.** F. P. McWHORTER (Science, 1937, 86, 179).—Latent viruses are present in various species of *Lilium*. The parallelism to potato latent viruses is discussed.

L. S. T.

**Ascorbic acid as an inactivating agent of tobacco mosaic virus.** M. LOJIKIN (Contr. Boyce Thompson Inst., 1937, 8, 445—465).—Autoxidation of ascorbic acid under the influence of  $\text{Cu}^{++}$ , but not that occurring in the presence of hexoxidase in alkaline solution, is accompanied by the capacity to inactivate highly purified tobacco mosaic virus. The inactivation in the presence of  $\text{Cu}^{++}$  depends on the formation of an intermediate product (not dehydro-ascorbic acid), and is inhibited by catalase. The active agent is possibly a peroxide.

A. G. P.

**Change of form of bacteria under the influence of lithium chloride.** L. O. KOBLMULLER (Z. Hyg., 1936, 118, 17—28).—Change of form of bacteria by LiCl results from a "disease" caused by this salt.

A. G. P.

**Action of salts on bacteria.** M. INGRAM (Rep. Food Invest. Bd., 1936, 89—92; cf. *ibid.*, 1935, 53).—The effect of NaCl and of heating to 50° in presence

and in absence of NaCl on uptake of  $\text{O}_2$  by halophilic and halophobic bacteria is investigated.

E. C. S.

**Toxicity of thiocyanates to bacteria. III. Effect of acid and alkaline solutions of thiocyanates on tubercle bacilli and on tuberculous sputum.** G. LOCKEMANN and W. ULRICH (Z. Hyg., 1936, 118, 117—132).—HCNS and acidified solutions of NaCNS are strongly toxic to the bacilli in aq. suspension. In solutions up to 8N neither NaOH nor NaCNS destroys the organisms, but mixed solutions have considerable toxicity which, however, is < that of acid NaCNS. The activity of acid is > that of alkaline solutions of NaCNS on sputum, disinfection of which is preferably carried out in two stages: (i) using alkaline NaCNS to free the organisms from the viscous mucus, (ii) using acid NaCNS to destroy the bacteria.

A. G. P.

**Action of phenols on bacteria. Effect of chemical constitution with special reference to salicylic acid, salicyl aldehyde and alcohol, and of their mono- and di-halogeno-derivatives. III.** P. DELAUNAY (J. Pharm. Chim., 1937, [viii], 26, 177—216; cf. this vol., 183, 359).—Many phenols which have antigenetic action do not exhibit antibiotic activity in aq. suspensions of *Staphylococcus pyogenes aureus* because of their low solubility.  $o\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CHO}$  (I),  $o\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{H}$  (II), and  $o\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CH}_2\cdot\text{OH}$  decrease in antigenetic activity in the order named; the order is reversed as regards antibiotic activity. The action of solutions of different phenols in 5% peptone, urine, horse serum, Raulin's fluid, phthalate buffer at  $p_{\text{H}}$  5, 15% tartar emetic solution, and 5% glucose in inhibiting the growth of micro-organisms and in preventing the fermentation of 10% glucose by yeast is studied. 5-Chlorosalicylic acid (III), (I), and its Cl- and Br-derivatives, and 5-chlorosaligenol (all <0.15%) have antigenetic properties in 5% peptone. 0.1% of (III) or (I) sterilises urine. Horse serum is not easily protected against bacterial infection but 5-chloro- (IV) (0.6%) and 5-bromo-salicylaldehyde (V) (0.75%) are moderately effective. Raulin's fluid is sterilised by small concns. of many phenols, notably by 0.01% of (IV) or (V). A phthalate buffer at  $p_{\text{H}}$  5 is sterilised by 0.2% of PhOH and many other phenols. Tartar emetic solution is preserved by 0.005% of (IV) or (V) and less readily by other phenols. 5% glucose is protected by 0.2% of PhOH, 0.25% of (II), (IV), and (V) and by other phenols. 0.1% of (II) completely inhibits the fermentation of 10% glucose by yeast. (III) and its Br-analogue are nearly as efficient. Many other phenols have this inhibitory action to a greater or less extent.  $o\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{Me}$  and its halogen derivatives have little antigenetic effect. Most of these substances are toxic to rats.

J. L. D.

**Bactericidal action of pectin.** E. HAYNES, C. A. TOMPKINS, G. WASHBURN, and M. WINTERS (Proc. Soc. Exp. Biol. Med., 1937, 36, 839—840).—Addition of 2% of pectin to heart-infusion broth lowers the  $p_{\text{H}}$  from 7.6 to 5.0—5.4. Such broth in 48 hr. has a bactericidal action which is  $\geq$  if the  $p_{\text{H}}$  is adjusted to >6.0.

H. G. R.

**Antimicrobial action of some aromatic compounds.** A. GIRARD, A. RAY, and G. RICHARD (Nature, 1937, 140, 283).—When administered orally to mice, 4:4'-diacetamidodiphenylsulphoxide, m.p. 292° (uncorr.), and other *s*- or *as*-sulphoxides containing *p*-OH, -NH<sub>2</sub>, or -NO<sub>2</sub> show a high curative activity against *Streptococcus*, and against experimental gonococcal infection. L. S. T.

**Action of atropine and eserine on adrenaline secretion caused by potassium and calcium chlorides.** G. KATZ and G. KATZ (Proc. Soc. Exp. Biol. Med., 1937, 36, 848—851).—Secretion of adrenaline induced by KCl or CaCl<sub>2</sub> is diminished by intravenous injection of atropine. Results with eserine were variable. H. G. R.

**Determination of adrenaline in blood.** J. M. ROGOFF (Proc. Soc. Exp. Biol. Med., 1937, 36, 441—444).—The method depends on the increased sensitivity of the denervated eye to adrenaline (I) caused by repeated small injections. The reaction can be used to detect small amounts (1 in 100—500 million) of (I). The reaction occurs in 2—4 sec. with intra-arterial and in 6—15 sec. with intravenous injections. All the (I) is contained in the serum or plasma. P. G. M.

**Effect of various hormones on blood-glutathione. I. Adrenaline and cortin.** E. ZUNZ and O. VESSELOVSKY (Enzymologia, 1937, 3, 281—287; cf. A., 1935, 1153).—In the dog intravenous injection of adrenaline or cortin increases the reduced glutathione (I) content of erythrocytes, the total (I) increasing in proportion. A. L.

**Effect of repeated cortin injections on renal excretion in the normal organism.** F. A. HARTMAN, L. LEWIS, and G. TOBY (Science, 1937, 86, 128—129; cf. this vol., 121).—In dogs, initial injections produced a marked reduction in the Na<sup>+</sup> and Cl<sup>-</sup> excreted, and usually an increase in the K<sup>+</sup>. After repeated injections the response diminished and eventually disappeared. L. S. T.

**Effect of cortin on high blood-non-protein-nitrogen of partially nephrectomised rabbits.** M. H. KUIZENGA (Proc. Soc. Exp. Biol. Med., 1937, 36, 665—667).—Injection of cortin causes a decrease in blood-non-protein-N. H. G. R.

**Adrenal cortex. III. Structures of compounds A, B, and H.**—See A., II, 459.

**Similarity of action of purified cortical adrenal extracts to crystalline androsterone and testosterone.** I. S. KLEINER, A. I. WEISMAN, and D. I. MISHKIND (Science, 1937, 86, 159—160).—Like cryst. androsterone and testosterone, purified extracts of adrenal cortex, prepared for administration to man and obtained from three different sources, can initiate the lengthening of the ovipositor of the female bitterling (cf. this vol., 38, 151; Kleiner *et al.*, A., 1936, 1428). L. S. T.

**Mechanism of morphine hyperglycaemia. Role of the adrenal glands.** R. C. BODO, F. W. COTUI, and A. E. BENAGLIA (J. Pharm. Exp. Ther., 1937, 61, 48—57).—No hyperglycaemia occurs after

subcutaneous administration of morphine to cats or dogs if the adrenals are inactivated. H. G. R.

**Effect of sterols on the thymus in adrenalectomised rats.** J. SCHACHER, J. S. L. BROWNE, and H. SELYE (Proc. Soc. Exp. Biol. Med., 1937, 36, 488—491).—Thymus involution occurs in adrenalectomised rats after administration of oestrone (I), oestradiol, or testosterone. Pregnanediol is ineffective but enhances the effect of subsequent treatment with (I). The toxicity of sterols parallels their physiological activity. P. G. M.

**Lactoflavin combined with phosphoric acid after adrenalectomy.** F. VERZAR, H. HUBNER, and L. LASZT (Biochem. Z., 1937, 292, 152—158).—The liver of normal rats contains approx. 0.001% of total flavin (I), approx. 5% of which is free and the rest combined as yellow enzyme. The total (I) is reduced by approx. 50% during the first 4 days following adrenalectomy in rats, cats, and dogs, the amounts of free and combined (I) becoming approx. equal. F. O. H.

**Disturbance of carbohydrate metabolism by removal of the adrenal cortex and its relationship to sodium metabolism.** L. LASZT and F. VERZAR (Biochem. Z., 1937, 292, 159—173).—Adrenalectomy in rats prevents the selective intestinal absorption of glucose (I), the resulting rate equalling that of xylose (II), the absorption of which is unchanged. After adrenalectomy, ingested or subcutaneously injected (I), (II), fructose, galactose, or arabinose has a marked toxic action, 2—2.5 g. being a fatal dose. Aq. urea or NaCl of tenfold hypertonicity is tolerated. Ingestion of (I) or a mixed diet causes a loss of Na<sup>+</sup> (equal to 40—50% of the blood-Na<sup>+</sup>) and H<sub>2</sub>O. The disturbance is one of carbohydrate metabolism and is corr. by administration of preps. of adrenal cortex. F. O. H.

**Absorption of various sugars after adrenalectomy.** N. JUDOVITS and F. VERZAR (Biochem. Z., 1937, 292, 182—188).—Following adrenalectomy in rats, absorption from the small intestine of glucose (I) and galactose (II) is reduced by 50%; that of mannose, sorbose, xylose, and arabinose is unchanged, whilst the relatively greater rate of absorption of (I) and (II) from the upper half of the small intestine is less apparent. F. O. H.

**Adrenal insufficiency.** J. STAHL, D. W. ATCHLEY, and R. F. LOEB (J. Clin. Invest., 1936, 15, 41—46).—The decrease in blood-Na and the increase in -urea in adrenal insufficiency may be simultaneous but are not interdependent. Withdrawal of NaCl from the diet of an adrenalectomised dog (maintained on cortical extract) caused an increase in -urea and a decrease in -Na. Withdrawal of the extract produced similar effects. Very potent extracts caused no change in -Na or -urea on a low-salt diet. Withdrawal of NaCl or extract diminished renal function. Lowered dosage of extract decreased NH<sub>3</sub> excretion. Large dosage of extract improved the general condition prior to consistent changes in -Na, -K, or -urea. Standardisation of extracts based on -urea changes in adrenalectomised dogs is unreliable unless the salt intake is controlled. CH. ABS. (p)

**Effect of hypophysectomy on blood-lactic acid of *Rhesus* monkeys.** A. H. SCOTT (Proc. Soc. Exp. Biol. Med., 1937, 36, 540—542).—The blood-lactic acid of *Rhesus* monkeys falls from 104 to 50 mg. per 100 c.c. following hypophysectomy. P. G. M.

**Effect of diet on glucose tolerance of normal and hypophysectomised dogs.** T. E. WEICHSELBAUM, P. HEINBECKER, and M. SOMOGYI (Proc. Soc. Exp. Biol. Med., 1937, 36, 802—803).—Hypophysectomised animals showed a decreased glucose tolerance on a high-fat-low-carbohydrate diet.

H. G. R.

**Composition of milk from rabbits stimulated by the lactogenic hormone.** A. J. BERGMANN and C. W. TURNER (J. Biol. Chem., 1937, 120, 21—27).—The lactose (I) content of the milk from the experimentally stimulated gland is approx. related to the activity of the gland. Experimental milk from the most active glands resembles colostrum in its (I) and total solid content but has higher fat and lower ash contents.

R. M. M. O.

**Influence of hormones on the secretory activity of the regressing mammary gland.** G. A. GRANT (Biochem. J., 1937, 31, 1538—1543; cf. A., 1936, 1546).—Daily subcutaneous injections of 200—800 Riddle units of prolactin induced the secretion of small amounts of milk of low (0.4—0.8%) lactose content in regressing mammary glands of guinea-pigs. Administration of oestradiol (I) + progesterone reconditioned the acinar tissue of the glands so that prolactin (80 units daily) initiated considerable flow of milk of lactose content 1.7—2.8%. (I) alone gave a much less marked response to prolactin.

J. L. C.

**Prolactin-like reactions produced by pituitaries of vertebrates.** C. P. LEBOND and G. K. NOBLE (Proc. Soc. Exp. Biol. Med., 1937, 36, 517—518).—A prolactin-like reaction is produced by implantation of the pituitary of various vertebrates and liver of all submammalian classes. P. G. M.

**Response of the pigeon crop gland to prolactin: inhibition of oestradiol monobenzoate.** S. J. FOLLEY and P. WHITE (Nature, 1937, 140, 505).—Injections of oestradiol monobenzoate inhibit the crop gland response to prolactin. L. S. T.

**Relation of urinary excretion of oestrone to the menstrual cycle of normal women.** L. D. YERBY (Proc. Soc. Exp. Biol. Med., 1937, 36, 496—498).—Two peaks of oestrone excretion occur, at the 15th and 27—28th days respectively. The first is probably due to an increased production by the ripe follicle at the time of ovulation. P. G. M.

**Progesterin and oestrin of nineteen placentas from normal and toxæmic cases.** G. V. S. SMITH and J. H. KENNARD (Proc. Soc. Exp. Biol. Med., 1937, 36, 508—510).—The placentas of late pregnancy toxæmia have normal progesterin but lowered oestrin contents. P. G. M.

**Oestrogenic potency of orally administered oestriolglycuronide.** A. D. ODELL, D. I. SKILL, and G. F. MARRIAN (J. Pharm. Exp. Ther., 1937, 60, 420—424; cf. this vol., 74).—Oestriolglycuronide

(I) is only slightly more potent when administered orally than when injected subcutaneously in the same medium. The oestriol (II) combined in (I) has approx. the same oral unit as free (II). The intestinal tracts of mice contain a glycuronidase which liberates (II) from (I). J. N. A.

**Effect of the white bean on oestrus in the mouse.** I. S. BELAK and J. SZATHMÁRY. II. L. ZSELYONKA and A. ILLÉNYI (Biochem. Z., 1937, 291, 259—262, 263—265).—I. In mice on a diet containing <12% of the bean (*Phaseolus vulgaris*), oestrus does not occur, consumption of food is reduced, and wt. is lost. The effect, which is not produced by the skin of the bean, is destroyed by boiling with H<sub>2</sub>O for 15 min.

II. The constituent of the bean which inhibits oestrus is the (globulin) phaseolin (I) or an accompanying product. <5% of (I) in the diet does not inhibit oestrus.

W. McC.

**Effect of the oestrous cycle on the metabolism of isolated rat uterus.** M. KERLY (Biochem. J., 1937, 31, 1544—1552).—Raising the glucose (I) content of the Ringer's solution increases the rate of anaerobic glycolysis. (I) is converted quantitatively into lactic acid. Uteri from rats in pro-oestrus show high vals. for anaerobic glycolysis and O<sub>2</sub> consumption, whilst aerobic glycolysis is low. In oestrus, anaerobic glycolysis and O<sub>2</sub> consumption are low, rising again in dioestrus. Aerobic glycolysis increases during oestrus. More (I) is used anaerobically than aerobically, showing that the Pasteur effect is operative throughout the cycle. Aerobic sugar usage is approx. const. throughout the cycle.

J. L. C.

**Folliculin and dihydrofolliculin in the urine of pregnant mares.** D. VAN STOLK and R. L. DE LENOHERE (Compt. rend., 1937, 205, 395—396).—Folliculin (10 g. from 1000 litres of urine) and dihydrofolliculin were isolated (no details given). An unidentified oil with marked oestrogenic properties was also obtained.

J. L. D.

**Successive hormone effects: active substance in urine → ovary → oviduct in *Rhodeus amarus*.** L. H. BRETSCHNEIDER and J. J. D. DE WIT (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 624—630).—Urine contains an active gonadotropic substance ("lutidin") causing luteinisation in ovaries of carp. Luteinisation is accompanied by production of a hormone "oviductin" causing enlargement of the oviduct.

J. L. C.

**Effect of emmenin on gonadotropic hormone excretion in castrates and spontaneous menopause.** U. J. SALMON and R. T. FRANK (Endocrinol., 1937, 21, 476—480).—In large doses emmenin prevents the over-excretion of gonadotropic hormone in the urine at the menopause.

H. G. R.

**Excretion of gonadotropin by normal males after ingestion and injection of extracts of pregnancy urine.** M. H. FRIEDMAN and G. L. WEINSTEIN (Endocrinol., 1937, 21, 489—494).—Oral ingestion of 8000—40,000 units or intramuscular injection of 480 units of Antuitrin-S caused no augmented excretion of gonadotropic substance

(I), though repeated injection of larger doses led to excretion of variable fractions,  $>20\%$  of the injected material. (I) of male urine resembles the active material of castrate rather than that of pregnancy urine. H. G. R.

**Augmentation of the gonadotropic hormone from the pregnant mare.** A. LEIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 609—611).—The action of the gonadotropic hormone is augmented by pituitary extracts containing primarily the luteinising hormone. H. G. R.

**Gonadotropic hormones of the turkey pituitary.** E. WITSCHI, A. J. STANLEY, and G. M. RILEY (Proc. Soc. Exp. Biol. Med., 1937, 36, 647—651).—The turkey pituitary is similar in quality to that of cattle, sheep, or rats. The potency of the desiccated material is  $>$  that of the ox but  $<$  that of sheep or rats. H. G. R.

**Antigonadotropic factor.** (A) Origin and preparation. (B) Species specificity and organ specificity. B. ZONDEK and F. SULMAN (Proc. Soc. Exp. Biol. Med., 1937, 36, 708—712, 712—717).—(A) The antigonadotropic factor (I) has its origin in the blood and is found especially in the serum. It may be conc. by pptn. of the serum with 4 vols. of  $\text{CO}_2$  and salting out from the insol. fraction with 48% saturated  $(\text{NH}_4)_2\text{SO}_4$ . (I) is not present in the liver, spleen muscles, or urine.

(B) An antigonadotropic serum has  $<0.5\%$  of its effectiveness if used against a heterologous gonadotropic factor and there is a loss of 93% of the effectiveness of (I) against human pregnancy-urine prolactin if used against human pregnancy-blood prolactin or against prolactin of human pituitary origin. H. G. R.

**Augmentation of the gonad-stimulating pituitary hormone by copper.** F. E. EMERY (Proc. Soc. Exp. Biol. Med., 1937, 36, 731—733).—Intraperitoneal injection of  $\text{CuSO}_4$  does not augment the action of pituitary implants on rat's ovaries. H. G. R.

**The comb of the baby chick as a test for the male sex hormones.** R. T. FRANK and E. KLEMPNER (Proc. Soc. Exp. Biol. Med., 1937, 36, 763—765).—The comb wt. is determined after external application of the hormone in sesame oil to the crest region. The reaction is very delicate when a small dosage is employed. H. G. R.

**Experimental production of intersexuality in the female rat with testosterone.** R. R. GREENE and A. C. IVY (Science, 1937, 86, 200—201).—In rats, injection of oestradiol into a mother antepartum or into a new-born female produces hypospadias. Administration of testosterone and its propionate at varying periods of pregnancy produces an arrest of vaginal development and varying degrees of intersexuality in the female. L. S. T.

**Preparation of epiallopregnanolone from allo-pregnanediol.**—See A., II, 459.

**Spermine, zinc, and insulin.** A. M. FISHER and D. A. SCOTT (J. Pharm. Exp. Ther., 1937, 61, 21—29).—The activity of an insulin (I)—Zn prep. towards rabbits is not increased by the addition of

spermine (II) but a prolonged hypoglycaemic action occurs after incubation of (I)—(II)—Zn at  $52^\circ$  for 1—2 weeks. H. G. R.

**Effect of diet on insulin response in normal and hypophysectomised dogs.** P. HEINBECKER, M. SOMOGYI, and T. E. WEICHELBAUM (Proc. Soc. Exp. Biol. Med., 1937, 36, 804—805).—In normal dogs change from a high-fat-low-carbohydrate to a low-fat-high-carbohydrate diet has little effect on the insulin response, whereas in hypophysectomised dogs there is an improvement. H. G. R.

**Alum-precipitated insulin.** L. ROSENTHAL and J. KAMLET (Proc. Soc. Exp. Biol. Med., 1937, 36, 474—476).—Alum-pptd. insulin produces a max. blood-sugar depression  $7\frac{1}{2}$ — $12\frac{1}{2}$  hr. after injection into human diabetics with recovery to initial levels in 15—30 hr. A similar prolonged effect is produced in rabbits. P. G. M.

**Attenuation of insulin by interfacial adsorption.** J. M. JOHLIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 523—524).—Aq. insulin ( $p_H$  2.5) was emulsified with  $\text{CHCl}_3$ , which was then evaporated at  $45^\circ$ . The cloudy solution deposited a ppt. on centrifuging which showed a considerable decrease in activity accompanied by prolongation. P. G. M.

**Inactivation of insulin by irradiated protein.** E. KATHER (Arch. exp. Path. Pharm., 1937, 185, 323—328).—Ovalbumin irradiated with ultra-violet light in  $\text{N}_2$  inactivates added insulin (I) due probably to the reduction of the active  $\cdot\text{S}\cdot\text{S}\cdot$  form of (I) to the inactive  $\cdot\text{SH}$  form by SH groups liberated in the photochemical reaction. P. W. C.

**Mutual action of thyroxine and cocaine in the animal body.** D. E. HYKESOVA and J. RERABEK (Arch. exp. Path. Pharm., 1937, 185, 599—611).—Thyroxine increases the rise in body-temp. brought about by cocaine (I) but acts antagonistically to (I) in respect of its effect on the central nervous system. P. W. C.

**Influence of thyroxine on rabbit's serum-phosphatase with reference to hyperthyroid diseases.** K. PELCZAR and S. MURZA-MURZICZ (Biochem. Z., 1937, 292, 212—217).—Administration of thyroxine to rabbits and to men with thyroid hyperfunction increases the activity of the blood-phosphatases with glycerophosphoric, adenylic, and guanylic acids as substrates, the increases showing marked individual variations. F. O. H.

**Effect of vitamin-C on heart muscle metabolism in hyperthyroidism.** H. BERG (Arch. exp. Path. Pharm., 1937, 185, 359—367).—The adenylypyrophosphoric acid content of guinea-pig heart muscle decreases by 25—50% after thyroxine and also after administration of the thyrotropic hormone of the anterior lobe of the pituitary, the effect being in the former case inhibited and in the latter not inhibited by ascorbic acid. P. W. C.

**Rôle of thyroid in increased protein metabolism of phloridzin diabetes.** I. A. MIRSKY, J. D. HEIMAN, and S. SWADESH (Proc. Soc. Exp. Biol. Med., 1937, 36, 512—515).—Phloridzin probably exerts some sp. effect on the kidney which in turn

stimulates the thyroid, thus increasing protein metabolism. P. G. M.

**Effects on blood-amylase of variations in thyroid activity.** W. BARTLETT, jun. (Proc. Soc. Exp. Biol. Med., 1937, 36, 843—848).—Blood-amylase (I) varies inversely with thyroid activity. There is a decrease in (I) following thyroidectomy in thyrotoxic states and the return to normal lags behind the improvement in clinical state. H. G. R.

**Synergism and antagonism of vitamins.** R. TISLOWITZ (Sci. Progr., 1937, 32, 290—294).—A review.

**Relation of vitamins to diphtheria toxin and antitoxin.** M. MINO (Japan Z. Mikrobiol. Path., 1935, 29, 1538—1552).—Resistance of guinea-pigs to diphtheria toxin was higher when vitamin-C than when -A, -B, or -D was added to the diet.

CH. ABS. (*p*)

**New source of vitamin-A.** J. A. LOVERN, J. R. EDISBURY, and R. A. MORTON (Nature, 1937, 140, 276).—The viscera of halibut, other than the liver, are a rich and hitherto neglected source of vitamin-A. The vitamin may, in part at least, be associated with protein. L. S. T.

**Biological conversion of carotene into vitamin-A.** H. WILLSTAEDT (Enzymologia, 1937, 3, 228—230).—The growth of fibroblasts in fowl blood-plasma containing vitamin-A was > in the -A-free plasma. Addition of carotene improved growth only when liver tissue was also present. A. L.

**Relation of bile acids to absorption of  $\beta$ -carotene in the rat.** J. D. GREAVES and C. L. A. SCHMIDT (Proc. Soc. Exp. Biol. Med., 1937, 36, 434—437).—There is no evidence that taurocholic and glycocholic acids and decholin form compounds with  $\beta$ -carotene (I). Intravenous is less effective than oral administration of (I). P. G. M.

**Inhibition by phenol derivatives of the auto-oxidation of vitamin-A. Thyroxine-vitamin-A antagonism.** W. FLEISCHMANN and S. KANN (Biochem. Z., 1937, 292, 296—300).—Thyroxine, di-iodotyrosine, tyrosine, and adrenaline, but not, e.g., phenylalanine, inhibit the autooxidation of vitamin-A. F. O. H.

**Vitamin- $B_1$  and the synthesis of fat from carbohydrate.** E. W. MCHENRY (Science, 1937, 86, 200).—A discussion. L. S. T.

**Effect of choline on the vitamin- $B_1$ -sparing action of fats.** E. W. MCHENRY (Biochem. J., 1937, 31, 1616—1621).—When choline (I) is added to a vitamin- $B_1$ -deficient diet, the optimum amount of fat required to prevent loss of wt. is about 40%. When - $B_1$  is given, but (I) is deficient, the optimum amount of fat is 10—26%. P. G. M.

**Beriberi vitamin.** R. R. WILLIAMS (Ind. Eng. Chem., 1937, 29, 980—984).—A review of the isolation and synthesis of vitamin- $B_1$ . F. O. H.

**Analogues of aneurin.**—See A., II, 472.

**Action of synthetic vitamin- $B_1$ .** C. R. ECKLER and K. K. CHEN (Proc. Soc. Exp. Biol. Med., 1937, 36,

458—460).—Natural cryst. vitamin- $B_1$  and the synthetic product are pharmacologically identical.

P. G. M.

**Use of synthetic zeolites in the isolation of vitamin- $B_1$ .** I. Experiments with rice polishings. L. R. CERECEDO and D. J. HENNESSY. II. Experiments with brewers' yeast. L. R. CERECEDO and F. J. KASZUBA. III. Experiments with wheat germ. L. R. CERECEDO and J. J. THORNTON (J. Amer. Chem. Soc., 1937, 59, 1617—1619, 1619—1621, 1621—1622).—Isolation of pure vitamin- $B_1$  from these materials is readily accomplished by base exchange with synthetic zeolites (best "Decalso"). The methods vary somewhat with each material, particularly with respect to the purification needed prior to treatment with the zeolite. The vitamin recovered is purified by way of the Ag salt and silicostungstate. R. S. C.

**Utilisation of vitamin- $B_1$  from fullers' earth adsorbates.** J. C. KERESZTESY and W. L. SAMPSON (Proc. Soc. Exp. Biol. Med., 1937, 36, 686—687).—Vitamin- $B_1$ -depleted rats cannot utilise fully the vitamin present in fullers' earth adsorbates.

H. G. R.

**Synthesis of cocarboxylase from vitamin- $B_1$ .** K. G. STERN and J. W. HOFER (Enzymologia, 1937, 3, 82—95; cf. this vol., 354).—The compound obtained by the action of  $\text{POCl}_3$  on synthetic vitamin- $B_1$  is probably a diphosphoric ester of - $B_1$  and identical with cocarboxylase (I). Whole blood or extracts of brain, liver, or intestine do not produce (I) from - $B_1$  +  $\text{PO}_4'''$  or  $\text{P}_2\text{O}_7'''$ . W. McC.

**Vitamin content of wheat and rye.**—See B., 1937, 1118.

**Determination of aneurin (vitamin- $B_1$ ) in urine by the thiochrome reaction.** H. G. K. WESTENBRINK and J. GOUDSMIT (Rec. trav. chim., 1937, 56, 803—810).—Aneurin (I) can be determined in urine by the thiochrome (II) reaction if adsorption of less readily adsorbed substances is prevented by dilution and if oxidation is avoided. (I) is adsorbed from the dil. urine by C, oxidised to (II) by alkaline  $\text{K}_3\text{Fe}(\text{CN})_6$  in  $\text{N}_2$ , and (II) determined by extraction with  $\text{Bu}^n\text{OH}$  and measurement of the blue fluorescence (Cohen, A., 1935, 466). A blank experiment and standardisation by pure (I) are essential. The method is checked by addition of (I) to urine and supported by determinations on human urine excreted before and after ingestion of (I). R. S. C.

**Vitamin- $B_2$  and the hormone of the adrenal cortex.** F. VERZAR and L. LASZT (Enzymologia, 1937, 3, 16—20).—Young adrenalectomised rats receiving no hormone (I) of the adrenal cortex survive if given lactoflavinphosphoric acid (II) but not if given lactoflavin (III) itself. (I) converts (III) into (II) and hence (I) preserves life in the rats only if the diet contains (III). There is no relationship between the amounts of (I) and (III) required for survival. The optimal amount of (III) for survival is 0.02 mg. per rat (wt. 20—50 g.) daily. W. McC.

**Factors which cure dermatitis and promote growth in rats.** H. VON EULER and M. MALMBERG (Biochem. Z., 1937, 291, 368—384).—Yeast extract

and herring's muscle contain a factor  $B_v$  stable to heat, alkali, and irradiation with visible light and possibly identical with vitamin- $B_6$  and with Chick and Copping's factor  $Y$  (A., 1935, 544). In rats suffering from loss of wt. and dermatitis resulting from a diet containing cod-liver oil, aneurin, and lactoflavin but lacking growth-promoting and anti-dermatitis factors,  $B_v$  cures the disease and promotes growth.  $B_v$  is pptd. by  $\text{AgNO}_3$  and by  $\text{Hg}(\text{OAc})_2$  and, like  $-B_6$  and  $Y$ , is probably a mixture. W. McC.

**Stabilisation of vitamin-C by pyrophosphate.** K. V. GIRI (Proc. Soc. Biol. Chem. India, 1937, 2, 17—18).— $\text{P}_2\text{O}_7^{4-}$  protects vitamin-C from oxidation both in alkaline ( $p_H$  7.2) and acid ( $p_H$  5.0) solutions, and inhibits the Cu-catalysed oxidation of -C dissolved in  $\text{H}_2\text{O}$  or 5%  $\text{CCl}_3\text{CO}_2\text{H}$ . L. D. G.

**Absorption of vitamin-C. Modification of Tillmans' method for determining ascorbic acid in colourless body-fluids.** N. BEREND and M. FISCHER (Biochem. Z., 1937, 291, 221—228).—Vitamin-C cannot be determined in whole blood and losses of 25—35% occur on deproteinisation. No loss occurs when the determination is made, without deproteinisation, in non-haemolytic, non-lipæmic serum, plasma, lymph, or cerebrospinal fluid acidified with  $\text{HCl}$  ( $p_H$  1.5—3.5). In cats during -C absorption, the -C content of the lymph increases, that of the portal blood is doubled during the first hr., that of the blood of the inferior vena cava increases greatly, and that of the liver increases by 67%, 10% of the -C given being stored in the liver. Reversibly oxidised -C is not found in blood. Unexplained loss of -C occurs in the intestine, where some -C is destroyed by bacteria. In rats  $\text{CH}_3\text{I}\cdot\text{CO}_2\text{H}$  decreases the rate of absorption of -C. W. McC.

**Antiscorbutic properties of a salt of iron and ascorbic acid.** M. PIJOAN (Science, 1937, 86, 80—81).—A salt (20% Fe and  $p_H$  6.9 in M-solution) of reduced Fe and *l*-ascorbic acid (I) has a high antiscorbutic activity when injected intravenously into scorbutic guinea-pigs and into man. Single daily doses increased plasma-(I) vals. The double linking of the (I) mol. appears to be still present in the salt. L. S. T.

**Biologically active 4-ketohexuronic acids (ascorbic and isoascorbic acids).** M. BACHSTEZ and G. CAVALLINI (Chim. e l'Ind., 1937, 19, 433—435).—*iso*Ascorbic acid (I) (A., 1934, 870) (improved prep. through Na diisopropylidene- $\beta$ -ketogluconate) has a dissociation const. index  $p_K$ , 4.18, in close agreement with the val. (4.26) for ascorbic acid (II). The behaviour of (I) is almost identical with that of (II) towards the sp. oxidase of (II). It is suggested that (I) is partly converted into (II) in the tissues. E. W. W.

**Oxidation of ascorbic acid by peroxidase systems. Action of hæmoglobin derivatives.** M. FISCHER (Biochem. Z., 1937, 292, 271—275).—Ascorbic acid (I) is oxidised by peroxidase systems and by  $\text{FeSO}_4\cdot\text{H}_2\text{O}_2$  at acid reactions. Hæmin considerably diminishes autoxidation of (I) at neutral reactions but not in presence of  $\text{H}_2\text{O}_2$ ;  $\text{HCN}$  inhibits oxidation in the latter system. Carboxy- and oxy-

hæmoglobin in presence of  $\text{H}_2\text{O}_2$  effect oxidation but hæmatoporphyrin, either alone or with  $\text{H}_2\text{O}_2$ , is ineffective. F. O. H.

**Ascorbic acid content of citrus fruits.**—See B., 1937, 1126.

**Oxygen consumption and enzyme content of the liver and phosphatase content of blood and bone in avitaminosis-C.** G. SCOZ, C. CATTANEO, and M. C. GABBRIELLI (Enzymologia, 1937, 3, 29—40).—In guinea-pigs, vitamin-C deficiency manifests itself in retarded growth, loss of wt., and decreased  $\text{O}_2$  consumption, in diminution of the  $\text{O}_2$  consumption of the liver, of its power to protect -C from oxidation, and of its contents of cathepsin (I), esterase (II), phosphatase (III) (exhibiting optimal activity at acid reactions), amylase, and phosphatase (exhibiting optimal activity at alkaline reactions) [the (I), (II), and (III) contents afterwards attain levels > the initial], in increase followed by decrease of the phosphatase (IV) content of the blood, in initial and final increases in the (IV) content of the bones, in retarded bone growth, and in progressive but limited increase in the ratio dry wt. : ash of the bones. W. McC.

**Influence of vitamin-C deficiency on the resistance of guinea-pigs to diphtheria toxin. Glucose tolerance.** A. SIGAL and C. G. KING (J. Pharm. Exp. Ther., 1937, 61, 1—9).—The vitamin-C intake for *in-vivo* detoxication of diphtheria toxin is > that necessary to protect from scurvy or show a favourable growth rate. H. G. R.

**Importance of the liver for the antirachitic efficiency of vitamin-D.** W. HEYMANN (Proc. Soc. Exp. Biol. Med., 1937, 36, 812—814).—The antirachitic potency of vitamin-D is decreased in rats with liver injury. H. G. R.

**Comparison of hypervitaminoses induced by irradiated ergosterol and fish-liver oil concentrates.** A. F. MORGAN, L. KIMMEL, and N. C. HAWKINS (J. Biol. Chem., 1937, 120, 85—102).—The toxic effect of pure calciferol in rats is exerted at a lower level than that of the vitamin-D of fish-liver oil. -A is not responsible for the change since very large excesses can only decrease but not eliminate the toxicity. The susceptibility of rats does not depend on sex; the females maintain a higher femur ash val. but show more advanced calcification of the viscera. R. M. M. O.

**Constituents of vitamin-E concentrates from rice- and wheat-germ oils.** A. R. TODD, F. BERGEL, H. WALDMANN, and T. S. WORK (Nature, 1937, 140, 361—362).—Acylation with  $p\text{-NO}_2\text{-C}_6\text{H}_4\text{-COCl}$  or  $\beta\text{-C}_{10}\text{H}_7\text{-COCl}$  of purified concentrates from the unsaponifiable portion of rice-germ oil gives a complex mixture of oily and cryst. esters. Hydrolysis of the latter yields three cryst. isomeric alcohols,  $\text{C}_{30}\text{H}_{50}\text{O}$ , of m.p. 121—122°, 113—114°, and 119—120°. The last forms a  $\beta$ -naphthoate corresponding in properties with that of Kimm's active material (A., 1935, 1546), but like the other two has no vitamin-E activity. The last two have properties similar to the tritosterols obtained (A., II, 242) from wheat-germ oil concentrates. Parallel

experiments with wheat-germ oil gave  $\beta$ -amyrin and two isomeric alcohols,  $C_{30}H_{50}O$ , m.p. 113–114° and 175°, of the tritisterol type; neither possessed *-E* activity. In both cases, the purified oils remaining after removal of these cryst. alcohols have a high biological activity, and give on thermal decomp., considerable amounts of duroquinol. Treatment of the oil from the wheat concentrate with HCNO in  $C_6H_6$  yields a mixture of allophanates from which the products described by Evans *et al.* (A., 1936, 531) could be isolated, in addition to a cryst. allophanate, m.p. 70°. The purified oil from the rice concentrate gave, on keeping, a cryst. substance, m.p. 73°, apparently an aliphatic, mono-unsaturated alcohol (approx.  $C_{20}$ ). Saturation of the oil with HCNO in  $C_6H_6$  then gave a complex mixture from which an allophanate, m.p. 135–138°, having the properties of  $\beta$ -tocopheryl allophanate was isolated, together with a large amount of an allophanate, m.p. 195–200°.

L. S. T.

**Vitamin-E deficiency in the suckling rat.** M. M. O. BARRIE (Nature, 1937, 140, 426; cf. this vol., 283, 406).—The young of vitamin-E-deficient rats are born normal, but thyroid and anterior pituitary deficiency develop as a result of the lack of an essential constituent, probably *-E*, of the mother's milk. When fed by a normal rat, they show no sign of abnormality.

L. S. T.

**Effect of vitamin-E-deficient and muscular dystrophy-producing diet on the metabolism of guinea-pigs.** E. L. WOOD and H. M. HINES (Proc. Soc. Exp. Biol. Med., 1936, 36, 746–747).—The metabolic rate is normal.

H. G. R.

**Vitamin-K, the fat-soluble antihæmorrhagic vitamin.** H. DAM (Angew. Chem., 1937, 50, 807–811).—A lecture.

**Vitamin-P.** A. BENTSATH and A. SZENT-GYORGYI (Nature, 1937, 140, 426).—Vitamin-P requires the presence of traces of ascorbic acid for its activity. Such traces, which in themselves have no effect on the development of scurvy, are frequently present in a scurvy diet and enable *-P* to act.

L. S. T.

**Spectrography of vitamin-P (citrin) and of other flavone-like substances.** S. LAJOS and M. GERENDAS (Biochem. Z., 1937, 291, 229–236; cf. Bruckner and Szent-Gyorgyi, this vol., 82).—Hesperidin (I) exhibits absorption max. at 278 and 324 m $\mu$ . and min. at 255 and 315 m $\mu$ . The corresponding vals. for eriodictyol (II) are 290 and 326 m $\mu$ , and 251 and 325 m $\mu$ . whilst those for homoeriodictyol are 290 and 328 m $\mu$ , and 260 and 303 m $\mu$ . Quercetin exhibits max. at 258 and 375 m $\mu$ . and min. at 240 and 300 m $\mu$ . The absorption spectrum of citrin (III) is a combination of those of (I) and (II). The spectra of (I), (II), and (III) change as a result of decomp. on treatment with NaOH.

W. McC.

**Protoplasmic movement in the *Avena* coleoptile as related to oxygen pressure and age.** J. G. EYMERS and H. P. BOTTILLIER (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 589–595).—The difference between the temp.-velocity curves of protoplasmic movement in epidermal cells in young and in old *Avena* coleoptiles is due to  $O_2$  deficiency in

the young cells. This can be explained on the assumption that the  $O_2$  concn. of the medium decreases with rising temp., and that the area of cell surface available for  $O_2$  diffusion increases with age.

J. L. C.

**Chemical processes in *Sauromatum bulbis*.** A. W. H. VAN HERK (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 607–614).—The normal rise in temp. of the appendix of *S. guttatum* was not affected by removal of the tubers, female flowers, or sterile portion. Factors governing the rise in temp. are associated with the male flowers, and appear to take effect about 20 hr. before the temp. rise.

J. L. C.

**Oxidation-reduction potential of aqueous extracts of germinating barley.** J. JANICKI (Enzymologia, 1937, 4, 107–110).—The oxidation-reduction potential of aq. extracts of barley decreases strongly during germination, particularly from the 4th to the 10th day, the amylolytic power showing a considerable increase over the same period. Amylase activation in ungerminated barley by  $H_2S$  or papain is due to mobilisation of amylase activators probably brought about by displacement of the oxidation-reduction potential. The disappearance of  $\alpha$ -amylase (dextrinifying enzyme) during ripening of barley is not due to oxidation of ascorbic acid.

P. W. C.

**Oxidation-reduction potential of vine sap.** E. BELTRAN, P. ALDEBERT, and A. GRASSET (Compt. rend. Acad. Agric. France, 1937, 23, 533–538).—The  $r_H$  of saps of various vine stocks is determined and discussed in relation to suitability for growth in different soils.

A. G. P.

**Hydrogen-ion concentration in apples.** F. KIDD and C. S. HANES (Rep. Food Invest. Bd., 1936, 133–135).—The  $p_H$  of the sap of Bramley's Seedling apples rose continuously during storage from 2.8 to 3.7 in 100 days at 20°, to 3.4 in 200 days at 15°, to 3.3 in 270 days at 10°, and to 3.1 in >300 days at 3° and 1°. The rise in  $p_H$  closely corresponded with the fall in titratable acidity.

E. C. S.

**Concentration of mesothorium-I by duckweed (*Lemna*).** W. I. VERNADSKY, B. K. BRUNOWSKY, and C. G. KUNASHEVA (Nature, 1937, 140, 317–318).—Duckweed from Orangery Pond, near Leningrad, contains approx. 100 times more mesothorium-I (10<sup>-14</sup>%) than the  $H_2O$  in which it grows. Isotopes of Th are present in the  $H_2O$ , but they are not assimilated by the duckweed.

L. S. T.

**Manganese and cobalt in plant and animal economy.** E. BROWNING (Sci. Progr., 1937, 32, 276–289).—A survey.

**Determination of magnesium in plants.** N. D. COSTEANU (Bodenk. Pflanzenernahr., 1937, 4, 358–360).—Mg in plant ash is determined by the drop-reaction method using KI–NaOBr (cf. A., 1936, 1222).

A. G. P.

**Concentration of solutes in vacuolar and cytoplasmic saps.** E. PHILLIS and T. G. MASON (Nature, 1937, 140, 370–372).—When sap is expressed from cotton leaves by means of a hydraulic press, the concns. of solutes (Ca, Mg, and K) in successive fractions are < those obtained by expression in a vice, and remain practically const. with a rise in

pressure. In both cases, there is a large increase in concn. when the residue is frozen and pressure is again applied. This does not support the view that  $H_2O$  is filtered under pressure through the cytoplasm. Shearing forces, present in the vice but not in the hydraulic press, probably decompose the "vitaid" or continuous phase of the cytoplasm into proteins, lipins, and  $H_2O$ , whilst the solutes in the  $H_2O$  escape with the vacuolar sap. An approx. max. estimate of concns. of the solutes in the vacuole is thus given by the lowest concn. obtainable by direct pressing. Methods previously used for extraction of sap, e.g., boiling, freezing, grinding, and treatment with anaesthetics, all give mixtures of vacuolar sap with that produced by decomp. of the vitaid. L. S. T.

**Distribution of phosphatase activity and analysis of growth in Canada wonder bean.** V. IGNATIEFF (Biochem. J., 1937, 31, 1611—1615; cf. A., 1936, 1152).—The unit leaf rate and relative growth rate are closely correlated with the phosphatase (I) activity of the leaf and the increase of dry matter in the plant. (I) probably plays a part in carbohydrate metabolism. P. G. M.

**Assimilation of formaldehyde by green plants.** K. NOACK and G. PAECHNATZ (Naturwiss., 1937, 25, 569—570).—The poisonous effect of  $CH_2O$  on plants has been considerably underrated. 0.006% aq.  $CH_2O$  reduces respiration of *Elodea* by 50% and inhibits photosynthesis almost completely. A 0.004% solution reduces respiration of *Chlorella* by 50% and photosynthesis by 74%. The carbohydrate enrichment of marine plants after addition of  $CH_2O$  in the dark is illusory. The consumption of  $CH_2O$  by the plant is dependent on the partial pressure of  $O_2$  and may result from enzymic oxidation. A. J. M.

**Metabolism of nitrogen in apple-fruits.** A. C. HULME (Rep. Food Invest. Bd., 1936, 126—131).—The change-over from hydrolysis to synthesis of protein (cf. *ibid.*, 1935, 111) occurs immediately before the climacteric rise of respiration. The gain in protein-N is, in the first instance, at the expense of asparagine, but later the  $NH_2$ -acid-N also contributes. The respiration of fruit from trees injected with urea is >, and that from trees injected with urea +  $Na_2HPO_4$  <, that of normal fruit or that from trees injected with  $Na_2HPO_4$  alone. E. C. S.

**Physiology of plant nutrition. VI. Relation of respiration rate to carbohydrate and nitrogen metabolism of the barley leaf as determined by nitrogen and potassium deficiency.** F. G. GREGORY and P. K. SEN (Ann. Bot., 1937, 1, 521—561; cf. A., 1936, 1164).—In sand-cultured barley receiving varied levels of N and K supply the  $H_2O$  content and respiration rate of leaves diminished with deficiency of N and increased with that of K. With very low levels of K respiration diminishes. Respiration rates are max. in early leaves, but diminish in intermediate and increase again in the last leaves, the relative differences being influenced by manurial treatment. Respiration drift in the dark is also influenced by manurial application and leaf succession. High respiration rates are associated with low sugar and high  $NH_2$ -N contents in K-deficient plants; low

respiration is accompanied by high sugar and low N fractions in N-deficient plants. Interrelationships between respiration and N metabolism are discussed.

A. G. P.

**Drought-resistance of sunflower and potato.** H. F. CLEMENTS (Res. Stud. State Coll. Washington, 1937, 5, 81—98).—Drought conditions induced high N metabolism in the plants. In sunflower sol. carbohydrates increased in both stems and leaves, and the total leaf area was reduced. The drought-resistance of soya bean, sunflower, and potato decreased in the order named, the hemicellulose contents of the leaves showing a similar gradation.

A. G. P.

**Synthesis of nitrogenous substances in the living organism.** G. CALCAGNI (Riv. Biol., 1937, 22, 92—108).—Existing knowledge of the synthesis of N compounds (mainly in plants) is briefly reviewed. Exposure of  $CO_2 + H_2O$  or  $CO_2 + C$  to sunlight in presence of various catalysts did not yield any org. compound. Similar experiments with starch or glucose +  $NaNO_3$  or  $(NH_4)_2SO_4$  also gave negative results.  $CH_2O + aq. NH_3$  gave  $NH_2Me$  and  $(CH_2)_6N_4$  but no arginine. With  $KCN + NH_3 + NH_4$  salt,  $HCO_2H$  was formed whilst  $KCN + NH_3 + CH_2O$  (MeCHO) yielded glycine (alanine); in presence of  $COMe$ ,  $\alpha$ -aminoisobutyric acid was probably formed. The bearing of the data on plant synthetic processes is discussed. F. O. H.

**Evolution of hordenine in barley and the final relationship of this alkaloid to tyrosine.** Y. RAOUL (Compt. rend., 1937, 205, 450—452).—The hordenine (I) content of germinating barley (*H. murinum*, L.) increases from 0 to 280 mg. per kg. in 11 days and subsequently decreases to 0 in 30 days. The tyrosine (II) content first decreases and then increases but not to its original val., the increase corresponding with the complete utilisation of reserve protein-N. Assumption of the transformation of (II) into (I) accounts for about 23% of the total (II) lost, between the 11th and 17th days. J. L. D.

**Excretion of nitrogen by leguminous plants.**—See B., 1937, 1103.

**Influence of the protein content on the amount of amylase in barley and barley malt.** T. CHRZASZCZ and J. SAWICKI (Enzymologia, 1937, 4, Part II, 79—87).—The amylase content of different samples of barley varied from 36.8 to 434 (amylolytic power in terms of c.c. of 0.05N-I). The amount of combined amylase also varied, the amylolytic power increasing on treatment with  $H_2S$  and papain by 18.6 to 734%. No uniform relationship could be detected between species of barley or protein content and amylase content. P. W. C.

**Hydrolysis of sucrose by malic acid-malate mixtures.** C. S. HANES and F. KIDD (Rep. Food Invest. Bd., 1936, 131—133).—The rates of hydrolysis in the living apple are those predicted from observations made at similar  $[H^+]$  and temp. *in vitro*.

E. C. S.

**Influence of temperature on sucrose : hexose and fructose : glucose relations in potatoes.** J. BARKER (Rep. Food Invest. Bd., 1936, 174—177).—The increase in the sucrose : hexose ratio induced by

transfer to low temp. is transitory, and, except where accumulation of sugar is unduly high, the ultimate effect is to lower the ratio. Temp. has little effect on the equilibrium between fructose and glucose.

E. C. S.

**Changes in the sugars of the artichoke during storage [non-harvesting] and their conversion into alcohol.** G. DE VITO (Annali Chim. Appl., 1937, 27, 196—206).—During winter, inulin etc. in the tubers of the artichoke (*Helianthus tuberosus*) are converted into sucrose (I) so that finally 75% of the total sugar content is (I). For rapid transformation of all types of sugar present into EtOH, *Saccharomyces fragilis* is recommended.

F. O. H.

**Decomposition of ethylene chlorohydrin in potato tubers.** L. P. MILLER (Contr. Boyce Thompson Inst., 1937, 8, 479—492).— $\text{CH}_2\text{Cl}\cdot\text{CH}_2\cdot\text{OH}$  absorbed by potato tubers is rapidly decomposed in the tissues, although relatively stable in the expressed juice or in buffers of the same  $p_{\text{H}}$ .  $\text{Cl}'$  appearing during the decomp. is localised more particularly near the cut surfaces of the tubers.

A. G. P.

**Seasonal changes in the organic acids of rhubarb (*Rheum hybridum*).** A. ALLSOPP (Biochem. J., 1937, 31, 1820—1829).—The total plant content of citric (I) and malic (II) acids increases during the summer but not during the preceding period of sprouting, during which, however, there is a translocation of both acids from the rhizome to the newly formed shoots. The summer increase is related to photosynthesis. In terms of concn. (I) is min. in rhizome and roots in May and max. in October, and falls continuously in leaves until July. (II) increases to a max. in May, and is approx. const. till September, falling steeply in October. Both (I) and (II) are much more concn. in leaves than in rhizome during the sprouting period, although there is apparently no new formation at this time. The oxalic acid of the rhizome falls in April due to sprouting and then steadily increases until September, falling again steeply in October. The amount in leaves increases gradually throughout the season, falling in October. The total acid of rhizomes is min. in May and max. in September. Translocation of acids to the rhizome evidently begins as soon as they are formed in the leaves and continues throughout the season. The acids are probably not end-products, but are in equilibrium with other substances, probably carbohydrates.

R. M. M. O.

**Pigment glands of the tomato.** A. J. EWART (Ann. Bot., 1937, 1, 563—564).—Glandular hairs of tomato leaves contain a pigment resembling or identical with citrinin. Alkaline pigment extracts of tomato, unlike those of *Penicillium citrinum*, are rapidly oxidised in air yielding an insol. brown compound.

A. G. P.

**Fundamentals of photosynthesis.** J. FRANCK (J. Washington Acad. Sci., 1937, 27, 317—329).—A lecture. The chemical mechanism of photosynthesis is considered.

A. G. P.

**Physiology of *Coffea arabica*.** I. Photosynthesis of coffee leaves under natural conditions. F. J. NUTMAN (Ann. Bot., 1937, 1, 353—

367).—Assimilation rates of coffee leaves in relatively low light intensity  $\propto$  the intensity. High intensities diminish assimilation. Under all conditions the time lag between change of light intensity and resulting change in assimilation rate is  $< 2$  min. The mid-day decline in assimilation during periods of sunshine is not dependent on the  $\text{H}_2\text{O}$  status of the leaf or on the accumulation of assimilates.

A. G. P.

**Metabolic action between sensitiser and oxygen in light.** H. KAUTSKY (Biochem. Z., 1937, 291, 271—284).—The metabolic action between  $\text{O}_2$  and chlorophyll and its bearing on the accompanying changes in phosphorescence and fluorescence are discussed with reference to the conclusions of Gaffron (A., 1936, 1570).

F. O. H.

**Oxygen uptake of isolated plant tissue. I. Effect of phosphate and of added carbohydrate. II. Effect of inhibitors.** J. CALDWELL and J. MEIKLEJOHN (Ann. Bot., 1937, 1, 477—486, 487—498).—I. The  $\text{O}_2$  uptake of thin slices of tomato stem tissue was highest in the presence of  $0.033\text{M}\cdot\text{KH}_2\text{PO}_4$ , and somewhat lower in  $\text{H}_2\text{O}$ . Higher  $[\text{KH}_2\text{PO}_4]$  markedly lowered the intake. Vals. for tissue from plants in the 12-leaf stage were  $>$  for those in the 5-leaf stage. The  $\text{O}_2$  intake in plants beyond the flowering stage was very low. Addition of glucose or fructose increased the intake by tissue from young but not by that from old plants.  $\text{O}_2$  intake in old plants is limited by the activity of the respiratory enzyme system, and in very young plants by the amount of available respiratory substrate.

II. General inhibitors of enzymic activity depressed the  $\text{O}_2$  intake of stem slices to extents  $\propto$  the concn.  $0.033\text{M}\cdot\text{KCN}$  caused a reversible inhibition which was not exceeded by that of a  $0.33\text{M}$  solution.  $\text{NaF}$  and  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  had an irreversible action. The effect of  $\text{NaN}_3$  was reversible and was greater in acid than in alkaline solution. Malachite-green had a considerable and urethane a small inhibitory action. Aq.  $\text{C}_5\text{H}_{11}\cdot\text{OH}$  (1 in 30) caused complete inhibition but at concn. 1 in 3000 had substantially no effect.

A. G. P.

**Effect of hydrocyanic acid and hydrogen peroxide on the Blackman reaction in *Scenedesmus*.** H. GAFFRON (Biochem. Z., 1937, 292, 241—270).—The respiration of the green alga *S. basiliensis* is readily, and the assimilation only slightly, inhibited by  $\text{HCN}$ . The inhibitory effects, especially on the Blackman reaction, are dependent on light intensity (I). Metabolic relationships between assimilation and respiration and the apparent and true assimilation at high I are discussed. The parallel inhibitory action of  $\text{HCN}$  or  $\text{H}_2\text{O}_2$  decomp. and the Blackman reaction in most plants is purely accidental and is not related to the assimilation process. Differences in the action of  $\text{HCN}$  on  $\text{H}_2\text{O}_2$  decomp. and assimilation in *Chlorella* and *Scenedesmus* are indicated.  $0.0001\text{M}\cdot\text{HCN}$  inhibits the catalase action by 90%, at which state  $0.0002\text{M}\cdot\text{H}_2\text{O}_2$  lowers the rate of assimilation by 62%; with  $\text{H}_2\text{O}_2$ -treated algæ, the rate is retarded by 41% when I is high but not at all when I is low. The bearing of the results on theories of assimilation is discussed, the main problems being the fission of the

sensitiser, photochemical activation of the org. mol., and the nature of the reducing enzyme. F. O. H.

**Chlorophyll fluorescence and assimilation of carbonic acid.** VII. Dependence of the fluorescence curve of green leaves on oxygen pressure. H. KAUTSKY and R. HORMUTH (Biochem. Z., 1937, 291, 285—311; cf. this vol., 240).—The rate of  $O_2$  consumption by chlorophyll grains from chloroplasts of *Clematis paniculata* and the accompanying fluorescence depend on  $p_H$ . The oxidation process thus decreases owing to formation of acid. Photo-oxidation in living chloroplasts and the course of fluorescence in varying  $[O_2]$  are described and discussed. F. O. H.

**Hormonal nature of plant development processes.** M. C. TSCHAJLACHJAN (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 227—230; cf. A., 1936, 1570).—With the appearance of the first green leaf the plant becomes susceptible to the influence of a photoperiodic factor which causes or accelerates the development of sexual organs. The influence of the factor is localised in various parts of the plant but may be translocated by material carriers from leaves, *via* stems, to growing points. Processes of sexual development are initiated in leaves independently of the rate of growth. Flowering and seed formation are caused by a sp. flowering hormone and are not controlled entirely by the accumulation of particular substances within the plant or by the presence of auxin. Translocation of the hormone in the plant system is equally rapid in all directions and is unrelated to the polarity of the plant system. Basal movement occurs *via* the bark. The hormone is not species-sp. A. G. P.

**Influence of partial removal of the embryonic reserves on plant development and the probable presence of a growth factor.** O. VERONA and G. BONAVENTURA (Att. R. Accad. Lincei, 1937, [vi], 25, 53—55).—Removal of the embryonic food-reserves from cereal caryopses significantly diminishes subsequent growth; the diminution is not corr. by provision of sugars, starch, or extracts of pituitary, thyroid, or testicular glands. The presence of a growth factor is discussed. F. O. H.

**Salt accumulation and polar transport of plant hormones.** F. W. WENT (Science, 1937, 86, 127—128).—The polar transport of auxin (I) in the living plant behaves in a manner similar to that of ion accumulation; it consists of the concn. of (I) from apex towards the base of each cell. Curves of the amount of 3-indolylacetic acid transported through *Avena* coleoptile sections show that the amount transported from apex to base (normal transport) increases approx. linearly with the logarithm of the applied acid concn. up to 1 mg. per c.c. The curve for transport from base to apex (inverse transport) is similar except that the applied concn. must be 100 times as great to give numerically the same transport. The polar (I) transport mechanism thus handles a const. amount of indolylacetic acid independent of the existing gradient. L. S. T.

**Tumour production by hormones from *Phytomonas tumefaciens*.** G. K. K. LINK and H. W.

WILCOX (Science, 1937, 86, 126—127).—The tumours produced by the application of bacterial extracts of *P. tumefaciens* to hypocotyls of *Phaseolus vulgaris* are described. L. S. T.

**Role of heteroauxones in legume nodule formation, beneficial host effects of nodules, and soil fertility.** G. K. K. LINK (Nature, 1937, 140, 507).—The activator of nodulation produced in susceptible hosts by *Rhizobium phaseoli* and other nodule-forming organisms is probably 3-indolylacetic acid. This may account for the beneficial effects of green manuring with nodule-bearing plants, of fertilising with manures rich in dung and urine, or with compost, of humus soils, and of mycorrhizal fungi. L. S. T.

**Root production on application of indolylbutyric acid to *Cissus* aerial roots.** N. E. PFEIFFER (Contr. Boyce Thompson Inst., 1937, 8, 493—506).—Anatomical changes in the cellular structure of the roots following treatment at or near the tips with indolylbutyric acid (I) are recorded. The effects of naphthylacetic acid, indolyl-acetic and -propionic acids are similar to those of (I). A. G. P.

**Growth factors.** F. KÖGL, P. FILDES, A. LWOFF, B. C. J. G. KNIGHT, G. M. RICHARDSON, H. M. SINCLAIR, and M. A. H. TINCKER (Proc. Roy. Soc., 1937, B, 124, 1—13).—A report of a discussion. P. W. C.

**Preparation of plant growth-promoting substances.** I. Ethyl  $\alpha$ -naphthylglyoxylate,  $\alpha$ -naphthylglycollic acid, and  $\alpha$ -naphthylacetic acid.—See A., II, 456.

**Effect of dwarf disease on the lucerne plant.** J. L. WEIMER (J. Agric. Res., 1937, 55, 87—104).—Affected plants show yellowing of roots due to accumulation of a gum (resembling wound gum) largely in the vessels of the outer xylem. Gum appears, if at all in stems, only in the first few in. With the development of disease in the plants, transpiration diminishes and the permeability of the root system to  $H_2O$  decreases; the tops have higher  $[H^+]$  and titratable acidity, higher ash content, and less starch than healthy plants. A. G. P.

**Bromothymol-blue in aqueous sodium hydroxide as a clearing and staining agent for fungus-infected roots.** S. D. GARRETT (Ann. Bot., 1937, 1, 563).—Fresh or EtOH-pickled root tissue is soaked in N-NaOH containing 0.04% of bromothymol-blue. Meristematic tissue of root apices and young fungus hyphae, spores, and sporangia take up the stain. A. G. P.

**Rubidium and strontium toxicity to plants inhibited by potassium and calcium respectively.** A. M. HURD-KARRER (J. Washington Acad. Sci., 1937, 27, 351—353).—The toxicity of  $Rb^+$  was partly counteracted by  $K^+$  and that of  $Sr^{++}$  by  $Ca^{++}$ . In proportion to their concn. nutrient cations diminish the absorption and hence the injurious action of toxic cations which are sufficiently similar, chemically, to preclude selective absorption by the plants. A. G. P.

**Selenium in plants in relation to its occurrence in soils.** J. T. MILLER and H. G. BYERS (J.

Agric. Res., 1937, 55, 59—68).—Three groups of plants are distinguished: (a) those able to absorb Se readily without injury and in which Se may be a definite physiological requirement, (b) those able to take up moderate amounts of Se without severe injury, (c) those showing very limited tolerance to Se, of which they absorb only small amounts. A. G. P.

**Effect of certain nitrogenous compounds on the rate of decay of wood.** H. SCHMITZ and F. KAUFERT (Amer. J. Bot., 1936, 23, 635—638).—Asparagine increased the rate of decay of Norway pine (*Pinus resinosa*) heartwood and sapwood by *Lenzites trabea* and of paper birch (*Betula papyrifera*) sapwood by *Polystictus versicolor*, but did not affect that of birch heartwood by the latter organism.  $\text{NH}_4\text{NO}_3$  had no effect except in one instance. A. G. P.

**Biological origin of pentoses.** F. J. PATON (Chem. and Ind., 1937, 908).—Oxidation of a disaccharide by alkaline  $\text{KMnO}_4$  produces a conjugated compound yielding a hexose and a uronic acid on hydrolysis. If pentoses originate biologically by decarboxylation of uronic acids this would indicate the manner of origin of the hexose-pentose-uronic acid linkings found in nature. Since the disaccharide is usually the first product of photosynthesis that can be isolated the pentose unit may thus arise directly without intermediate formation of the hexose unit.

R. M. M. O.

**Analysis of carbohydrates of the cell wall of plants. IV. Determination of methylpentoses as methylfurfuraldehyde: methods of distillation and precipitation.** C. R. MARSHALL and F. W. NORRIS (Biochem. J., 1937, 31, 1289—1298).—The most suitable distillation method is a modification of that of Kullgren and Tyden (A., 1929, 1278) using HCl stabilised with an excess of NaCl. For the determination of methylfurfuraldehyde in aq. HCl phloroglucinol and thiobarbituric acid were suitable precipitants. A predetermined graph is necessary for use with titrimetric methods. High results obtained by titrimetric methods or by pptn. with 2:4-dinitrophenylhydrazine were caused by  $\text{COME}_2$  derived mainly from rhamnose. J. L. C.

[Constituents of] *Struthiopteris spicant*. F. J. GOODRICH and E. KOOZIN (Amer. J. Pharm., 1937, 109, 412—415).—The rhizomes contain 7.73% of starch, 6.5% of total and 3.89% of reducing sugars, 3.02% of pentosans, but no alkaloids, glucosides, or filicin. J. L. D.

**Chemical similarity and classification of the Hordeaceae.** H. COLIN and H. BELVAL (Compt. rend., 1937, 205, 191—193).—The base of the stem of *Elymus arenarius* contains reducing sugars, sucrose, and a fructoside (I),  $[\alpha]_D -43^\circ$  (the rhizomes and seeds contain less of these constituents), which is non-reducing and when partly hydrolysed has  $[\alpha]_D -82^\circ$ . (I) with dil. acids affords 5—6% of glucose and with emulsin,  $\beta$ -methylglucoside. These properties are compared with those of glucosides from other members of the same family. J. L. D.

**Hydrolysis of starch by hydrochloric acid at 20°. Phosphoric acid content of potato starch.**—See A., II, 446.

**Polyuronide from tobacco stalks.** E. BENNETT (Ind. Eng. Chem., 1937, 29, 933).—The isolation and partial analysis of a polyuronide from the cured stripped stalk of Havana seed tobacco is described. The chief sugar obtained on hydrolysis is xylose.

F. R. S.

**Hemicelluloses. III. Extraction and preparation.** A. G. NORMAN (Biochem. J., 1937, 31, 1579—1585; cf. A., 1935, 673, 1435).—When hot EtOH-NaOH is used as a pretreatment before hemicellulose (I) extraction, it must be shown analytically that the furfuraldehyde-yielding constituents have not been attacked. Extensive removal of (I) material is effected by extraction with cold 4% NaOH alternated with brief chlorination. Such extracts may contain a high proportion of polysaccharides derived from cellulose (II). Brief extraction with hot, more dil. alkali has less drastic effect on the (II) and such extracts may consist largely of polyuronide (I). The lignin content of the (I) preps. should always be determined; it may be reduced by brief treatment with  $\text{Cl}_2$  and thorough washing with EtOH of moderate concn.

P. W. C.

**Orientation of cellulose and "primary" substance in the growing *Avena* coleoptile.** K. WUHRMANN and M. MEYER (Naturwiss., 1937, 25, 539—540).—Cells of the apical portion of the coleoptile show negative and those of the base positive double refraction. Basal cells show thread-like instead of tubular structure. After extraction for 48 hr. with EtOH- $\text{C}_6\text{H}_6$ - $\text{C}_2\text{H}_5\text{N}$ , the degree of double refraction was decreased but showed the same variation. The phenomenon therefore depends on the presence of a doubly-refracting cellulose skeleton in which a doubly-refracting substance, which can be extracted by a suitable solvent, is embedded. A. J. M.

**Asparagose.**—See A., II, 446.

**Bletillamannan, a mannan from the tubers of *Bletilla striata*.**—See A., II, 446.

**Cremastramannan, the mannan of Japanese saleps.**—See A., II, 446.

**Constitution of new disaccharide "xyloglucuronic acid" from *Kadsura japonica*, Don.**—See A., II, 442.

**Presence of octadecatrienoic acids in seed-oils of pomegranate, karasu-uri (*Trichosanthes cucumeroides*), and balsam pear.** Y. TOYAMA and K. UOZAKI (J. Soc. Chem. Ind. Japan, 1937, 40, 249—250b).—The presence of punicic acid in pomegranate seed-oil (A., 1935, 960) was confirmed. Trichosanin acid was not found in the other two oils (cf. *ibid.*; A., 1936, 1307). Karasu-uri seed-oil contained a stereoisomeride of  $\beta$ -eläostearic acid whilst  $\alpha$ -eläostearic acid was isolated from balsam pear seed-oil. T. G. G.

**Constitution of the seeds of *Blepharis edulis*, Pers. II. Composition of the oil.** G. P. PENDSE and J. B. LAL (J. Indian Chem. Soc., 1937, 14, 362—366; cf. A., 1936, 911).—Oil extracted from the seeds with  $\text{C}_6\text{H}_6$  contains oleic 67, linoleic 13, stearic 6, palmitic, 4.6, and arachidic acid 0.03%, and unsaponifiable matter (3%) containing a

phytosterol, m.p. 115—117°. The oil on keeping deposits arnisterol (cf. Klobb, A., 1904, i, 410; 1905, i, 594).  
A. Li.

Fruits of *Solanum nigrum*, Linn. I. Composition of the oil from the seeds. G. P. PENDSE (J. Indian Chem. Soc., 1937, 14, 367—370).—Oil extracted with light petroleum contains oleic 64, linoleic 24, stearic 3.1, and palmitic acid 2.1%, and unsaponifiable matter (1.5%) containing a phytosterol, m.p. 127—129° (Ac derivative, m.p. 119—120°).  
A. Li.

Negatively doubly-refracting constituent of cuticular layers of the plant epidermis. M. MEYER (Naturwiss., 1937, 25, 539).—After extraction with fat solvents the negative double refraction of cuticular layers of various xerophytes disappeared. The wax mols. to which the refraction is probably due must be arranged perpendicularly to the surface of the cells, and hence to the sub-microscopic cellulose lamellae.  
A. J. M.

[Constituents of] *Rhus glabra*. G. H. MCFADDEN and R. L. McMURRAY (Amer. J. Pharm., 1937, 109, 397—406; cf. this vol., 161).—A 95% EtOH extract of the fruit contained a resin and an oil, hydrolysed by EtOH-KOH to glycerol, linoleic, oleic, palmitic, arachidic, and lignoceric acid, Bu<sup>n</sup>OH, and unsaponifiable material which contained a sterol, m.p. 137.2° (Ac derivative, m.p. 117—118°), and hentriacontane.  
J. L. D.

Croton resin. IV. Acids insoluble in light petroleum. J. R. SPIES (J. Org. Chem., 1937, 2, 62—67; cf. A., 1935, 527).—Saponification of croton resin gives fatty acids 30, acids (I) insol. in light petroleum 40, and H<sub>2</sub>O-sol. phenols 30%. Methylation of (I) with MeI-Ag<sub>2</sub>O gives esters (OMe 12.5%), from which the heptate, hexoate, and laurate, and Me<sub>2</sub> azelate (possibly derived by oxidation) are obtained; by hydrolysis these give an acid containing 7.3% of OMe. This indicates the presence of OH-acids in the resin. An active fraction was obtained, which was inactivated by methylation; the analogy with urushiol (Hill *et al.*, A., 1935, 246) is indicated.  
R. S. C.

Artostenone, a ketonic sterol from *Artocarpus integrifolia*.—See A., II, 459.

Intravacuolar inclusions in the fruit of the ivy (*Hedera helix*, L.). R. ÉCHEVIN and R. ULRICH (Compt. rend., 1937, 205, 247—249).—The pericarp of the immature fruit is rich in intravacuolar lecitihin (I) (1.7% of the dry wt.), the amount of which increases as the fruit matures. When mature fruit are dried, the (I) content of the pericarp decreases. The remaining portions of mature seed are (I)-free.  
J. L. D.

Chemical constituents of lichens found in Ireland. *Parmelia conspersa*, Ach. M. MOHAN, J. KEANE, and T. J. NOLAN (Sci. Proc. Roy. Dublin Soc., 1937, 21, 593—594).—Et<sub>2</sub>O extracts of the lichen yield usnic acid. Boiling COMe<sub>2</sub> extracts stictic acid from the residue.  
P. G. M.

Constituents of *Pertusaria concreta*, Nyl, form *Westringii*, Nyl.—See A., III, 462.

Constitution of xanthyletin.—See A., II, 465.

Allantoic acid in the leaves of *Coryllus avellana*. L. LEROUX (Compt. rend., 1937, 205, 172—173; cf. A., 1927, 284; 1926, 548).—The press-juice of the leaves, after treatment with uranium acetate, affords with xanthhydrol dioxanthylallantoic acid (I), which after hydrolysis with HCl is converted into *Ag allantoate*. The dried leaves contain 0.43 g. of (I) per kg. Hydrolysis of the press-juice with HCl at 60° affords urea. The reactions previously obtained (cf. A., 1927, 1116) for CHO·CO<sub>2</sub>H are due to (I).  
J. L. D.

Purines in the plant kingdom. New purine in tea. T. B. JOHNSON (J. Amer. Chem. Soc., 1937, 59, 1261—1264).—1:3:7:9-Tetramethyluric acid (cf. Fischer, A., 1884, 446) was isolated from the residues after the removal of caffeine from tea.  
A. Li.

Differences in amino-acid content of the leaf proteins of male and female hemp plants. A. KIEZEL and V. PASCHEVITSCH (Biochimia, 1937, 2, 666—673).—The proteins of male plants contain slightly less histidine and (CO<sub>2</sub>H)<sub>2</sub>-acids, and slightly more arginine and lysine, than do those of female plants.  
R. T.

Biochemical investigation of different varieties of Bengal rice. III. Enzymic digestibility of rice starch and protein. Action of salivary and pancreatic amylase, pepsin, and trypsin. K. P. BASU and S. MUKHERJEE. IV. Biological value of proteins of Aman and Aus rice and of their polishings by the balance-sheet and growth methods. V. Extraction and analysis of proteins of Aman and Aus rice. K. P. BASU and M. N. BASAK (Indian J. Med. Res., 1936, 23, 777—787; 1937, 24, 1043—1066, 1067—1076).—III. Data for the enzymic degradation of varieties of rice, polished and non-polished, are tabulated. The rate of hydrolysis is generally increased after polishing or parboiling.

IV. The biological val. of the proteins of Aus and Aman rice is 80, whilst that of the polishings is 68. Data indicating the nutritive val. of the proteins are given.

V. Data for the extractability, NH<sub>2</sub>-acid distribution, and nutritive val. of the proteins are given.  
W. O. K.

Partial fission of proteins. II. Gliadin. T. KUNISHIGE (J. Biochem. Japan, 1937, 25, 307—327; cf. Uchino, A., 1934, 1375).—The products yielded by fractional hydrolysis of gliadin with dil. H<sub>2</sub>SO<sub>4</sub> or NaOH under pressure at 170° were examined for N distribution and the data are compared with those for fibroin.  
F. O. H.

Extraction and analysis of the proteins of green gram (*Phaseolus mungo*), lentil (*Lens esculenta*), and *Lathyrus sativa* (Khesari). K. P. BASU, M. C. NATH, M. O. GHANI, and R. MUKHERJEE (Indian J. Med. Res., 1937, 24, 1027—1042).—Lentil, green gram, and *Lathyrus sativa* contain 22.6, 23.26, and 32.2% of protein, respectively, of which >90% is extractible by solvents. The low cystine content of the lentil proteins accounts for their low biological val. The globulin of lentil is deficient in tryptophan (I) and the glutelin in histidine. The

proteins of *L. sativa* are deficient in (I). Addition of (I) to rats on a diet of *L. sativa* improves the condition of the fur but does not increase growth. The poor growth on *L. sativa* diet is to be ascribed to the small intake of food due to the presence of some toxic substance in *L. sativa*. W. O. K.

**Flower pigments.** H. KÖRPERTH (Österr. Chem.-Ztg., 1937, 40, 432—434).—A brief review.

**Pigment of red autumn leaves of species of *Acer*.**—See A., II, 464.

**Colouring matters of *Drosera Whittakeri*.** V. Constitution of droserone.—See A., II, 460.

**Effect of light on pigments and dyes.** S. NAKAMURA and H. KANAZAWA (Proc. Imp. Acad. Tokyo, 1937, 13, 204—207).—The stability to sunlight of mineral pigments and natural indigo used in old Japanese arts is found by the Pulfrich cascade photometer to be very great. That of the dyes from *Lithospermum erythrorhizon* roots and *Carthamus tinctoria* flowers is somewhat less. R. S. C.

**Citraurin, polyene pigment of the orange.**—See A., II, 443.

**Occurrence and distribution of saponins in herb drugs.** (A) A. KUHN and G. SCHAFER. (B) M. ROBERG (Arch. Pharm., 1937, 275, 477, 478—479).—Polemical (cf. B., 1935, 573; this vol., 191). R. S. C.

**Origin and function of hordenine.** Y. RAOUL (Ann. Ferm., 1937, 3, 129—148; 193—218; cf. this vol., 305).—I. The physical and chemical properties, constitution, and synthesis of hordenine (I) are fully described.

II. The principal theories of the origin and function of alkaloids in plants are considered. Tyrosine is decarboxylated to tyramine (II) when heated at 250° under diminished pressure; (II) with  $\text{CH}_3\text{O}$  and  $\text{HCO}_2\text{H}$  gives (I). (I) with 30%  $\text{H}_2\text{O}_2$  yields the amine-oxide, m.p. 214°, converted by  $\text{Ac}_2\text{O}$  followed by hydrolysis with 15%  $\text{H}_2\text{SO}_4$  into methyltyramine. A microchemical technique for the localisation of (I) is described. The alkaloid is not present in the ungerminated grain but appears during the first days of germination (15—16°) and again disappears after about a month. H. W.

**Rôle and origin of alkaloids.** Y. RAOUL (Bull. Sci. pharmacol., 1937, 44, 114—120).—A general account, with special reference to the formation of hordenine. L. D. G.

**Pot-curare.**—See A., II, 474.

**Calcium iodate as a temporary preservative.** H. F. STEEDMAN (Nature, 1937, 139, 1072).—0.1% aq.  $\text{Ca}(\text{IO}_3)_2$  preserves certain classes of biological material. L. S. T.

**Use of *n*-butyl alcohol in the paraffin method.** A. G. LANG (Stain Tech., 1937, 12, 113—117).—Modifications in the use of BuOH in dehydrating are based on equilibria in the ternary system  $\text{H}_2\text{O}$ —EtOH—BuOH. E. M. W.

**Chromatograms of biological stains on acid and basic adsorbents.** C. H. LOU (Stain Tech., 1937, 12, 119—124).—Three types of adsorption

are recognised in the separation of stains by chromatographic analysis using different adsorbents. An artificial cell for demonstration purposes is described. E. M. W.

**Pyridine-formalin in Zenker-formol fixatives.** V. WARBRITTON (Stain Tech., 1937, 12, 125).— $\text{C}_5\text{H}_5\text{N}-\text{CH}_3\text{O}$  is unsuitable for use with Zenker's fluid owing to the formation of a ppt. E. M. W.

**Tress modification of cresyl-violet technique for staining nerve cells.** R. W. BARRIS and W. H. WALLER (Stain Tech., 1937, 12, 125—126).—Differentiation with  $\text{CHCl}_3$ — $\text{Et}_2\text{O}$ —EtOH (cf. A., 1935, 1146) solution is dependent on the presence of small amounts of  $\text{Cl}_2$  in the  $\text{CHCl}_3$ . AcOH is preferred to HCl for acidifying the EtOH used in completing differentiation. E. M. W.

**Improvements in the compressed-air ultra-centrifuge for biological work.** A. GRATIA (Compt. rend. Soc. Biol., 1937, 125, 1057—1058).—Sedimentation is fixed by freezing the material prior to stopping the apparatus. H. G. R.

**Micro-respiration vessel for moving organisms.** J. HELLER (Biochem. Z., 1937, 291, 245—246).—The vessel consists of a filter tube (with sintered glass filter plate) to which are attached by means of ground joints a glass cap above and a glass extension below. The capacity is 10—15 or 80 c.c. The vessel is suitable for use with, e.g., insect larvæ. W. McC.

**Anaerobic ultrafiltration.** P. H. LAVIETES (J. Biol. Chem., 1937, 120, 267—275).—An apparatus for anaerobic ultrafiltration of serum through Cellophane is described. There is no significant loss of  $\text{CO}_2$ , glucose, or protein, and the concn. of electrolytes in the ultrafiltrate is independent of the relative vol. of substrate and filtrate. J. N. A.

**Technique for investigation and determination of trephones.** L. GRIMARD (Compt. rend. Soc. Biol., 1937, 125, 853—855). H. G. R.

**Rapid method for protein dialysis.** F. W. BERNHART, L. E. ARNOW, and A. C. BRATTON (Ind. Eng. Chem. [Anal.], 1937, 9, 387—388).—350 c.c. of a solution of 35 g. of ovalbumin and 9 g. of  $(\text{NH}_4)_2\text{SO}_4$  were treated for 14 hr. in a simple distillation dialyser and then for 48 hr. in an electric dialyser. It then had the conductivity of distilled  $\text{H}_2\text{O}$  and measured 600 c.c. E. H. S.

**Utilisation of the fluorescence produced by sulphuric acid in the determination of bile acids in blood, faeces, and urine.** M. JENKE and F. BANDOW (Z. physiol. Chem., 1937, 249, 16—23).—Blood, faeces, and urine contain substances in addition to bile acids (I) which yield fluorescent solutions in  $\text{H}_2\text{SO}_4$  and hence intensity of fluorescence is not a measure of (I) content. The substances cannot be removed chemically. Cholic and glyco- and taurocholic acid exhibit a selective absorption band at 385.0 m $\mu$ . spectrographic examination of which enables the (I) content to be determined. Cholesterol, dihydrocholesterol, and indican interfere. W. McC.

**Mercuric salts and nitrous acid in the colorimetric determination of tyrosine and tryptophan**

present in solution. J. W. H. LUGG (Biochem. J., 1937, 31, 1422—1433).—In the determination of tyrosine (I) and tryptophan (II) contents of hydrolysates of plant-leaf proteins by the method of Folin and Ciocalteu a turbidity often develops. A modified procedure for the determination of (I) is described in which (I) is first treated with  $\text{Hg}^{\text{II}}$  salts, the resulting product with  $\text{HNO}_2$  giving a red colour. The ppt. of (II)  $\text{Hg}^{\text{II}}$  sulphate, which separates while (I) is being mercurated, is re-dissolved and treated with  $\text{HNO}_2$  under defined conditions. The colour thus produced is suitable for the determination of (II). The course of the reactions between (I) and (II) and  $\text{Hg}^{\text{II}}$  salts and  $\text{HNO}_2$  has been investigated and the effect of interfering substances determined. W. O. K.

**Determination of cystine in finger-nail clippings with hydrolysis for one hour.** M. X. SULLIVAN, H. W. HOWARD, and W. C. HESS (J. Biol. Chem., 1937, 119, 721—724).—Hydrolysis with 15N- $\text{H}_2\text{SO}_4$  at 150° for 1 hr. followed by dilution and decolorisation with C gave solutions suitable for colorimetric or iodometric determination of cystine. An average val. of 9.9% was obtained in 9 pathological cases by this method as compared with 10.1% by hydrolysis for 7 hr. with 20% HCl (cf. A., II, 89).

J. L. C.

**Photo-electric determination of glucose in blood and urine.** W. S. HOFFMAN (J. Biol. Chem., 1937, 120, 51—55).—The method depends on the diminution of colour due to reduction of  $\text{Fe}(\text{CN})_6^{4-}$ .

R. M. M. O.

**Use of the step-photometer in the determination of phosphoglyceric acid.** S. RAPOPORT (Biochem. Z., 1937, 291, 429—432; cf. this vol., 133).—The method previously described is applied to the determination (error 3%) of <0.03 mg. of phosphoglyceric acid in organs and in yeast, a step-photometer being used.

W. McC.

**Comparison of methods for the determination of furfuraldehyde yield of soils and plant materials.** C. N. ACHARYA (Proc. Soc. Biol. Chem. India, 1937, 2, 19—20, and Biochem. J., 1937, 31, 1800—1804).—In the presence of soil, the phloroglucinol method may be employed if  $\text{SnCl}_2$  is added to reduce oxidising agents in the soil. Hydroxymethylfurfuraldehyde may be removed from the ppt. with boiling EtOH.

L. D. G.

**Determination of thiocyanate in tissues.** B. B. BRODIE and M. M. FRIEDMAN (J. Biol. Chem., 1937, 120, 511—516).—The tissue is digested with EtOH-KOH and the digest is freed from EtOH and deproteinised by  $\text{HNO}_3$ - $\text{H}_2\text{WO}_4$ . The filtrate is made alkaline and pigments are removed by C, CNS' being determined colorimetrically as  $\text{Fe}^{\text{III}}$  salt in the resulting solution. With  $75 \times 10^{-6}$  g. of CNS', the error is approx. 8%.

F. O. H.

**Determination of ethereal sulphur in serum and urine.** S. LORANT and A. HERZOG (Biochem. Z., 1937, 292, 98—100; cf. this vol., 166).—The difference between the  $\text{SO}_4^{2-}$ -S vals. before and after hydrolysis (HCl) for 15 min. at 100° is the ethereal S.

W. McC.

**Micro-determination of chloride in biological fluids by means of solid silver iodate.** I. Gasometric analysis. II. Titrimetric analysis. III. Colorimetric analysis. J. SENDROY, jun. (J. Biol. Chem., 1937, 120, 335—403, 405—417, 419—439).—I. Solutions containing  $\text{Cl}^-$  are shaken with solid  $\text{AgIO}_3$ , and the sol.  $\text{IO}_3^-$  so formed is determined in the solution by its oxidative reaction with alkaline  $\text{N}_2\text{H}_4$ , the evolved  $\text{N}_2$  being measured manometrically. With 0.02 c.c. of serum, the error is 1%. No removal of proteins, either by pptn. or digestion, from urine, plasma, or serum is required, although protein-free filtrates of serum or whole blood can be used. The reactions involved in the method are discussed from the theoretical viewpoint.

II. The  $\text{IO}_3^-$  formed in solution is determined volumetrically, using acidified KI and  $\text{Na}_2\text{S}_2\text{O}_3$ , with starch as indicator. As in the gasometric procedure, proteins need not be removed, and the accuracy and rapidity of the two methods are about the same.

III. The I liberated as above is determined colorimetrically, either as free I or as the blue complex with starch. The method is applicable to salt solutions and protein-free filtrates only. It is not as accurate nor as rapid as the above methods, but it can be used for the determination of extremely small amounts of  $\text{Cl}^-$ , e.g., that contained in 0.0006 mg. of NaCl.

J. N. A.

**Determination of iodine in biological material.** C. D. STEVENS (J. Lab. Clin. Med., 1937, 22, 1074—1079).—The Fashena and Trevorrow method (A., 1936, 914) has been modified for use with 10 c.c. of blood.

H. G. R.

**Quantitative spectrographic analysis of biological material.** II. J. S. FOSTER and C. A. HORTON (Proc. Roy. Soc., 1937, B, 123, 422—430; cf. A., 1936, 536).—A spectrographic estimation of traces of B in plants, based on the Merton wedge photometer, is described.

E. M. W.

**Photometric determination of iron in blood and tissues by sulphosalicylic acid.** A. DE NIEDERHAUSEN and E. FERRARINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 229—230).—The tissue (0.05—0.3 g.) is digested with  $\text{H}_2\text{SO}_4$ - $\text{HNO}_3$  (1:3), the digest neutralised with NaOH and then acidified with HCl,  $\text{NH}_4\text{Cl}$ , aq.  $\text{NH}_3$ , and sulphosalicylic acid are added, and the resulting colour is examined photometrically.

F. O. H.

**Factors affecting the determination of inorganic iron in animal tissues.** D. R. BORDEN and C. A. ELVEHJEM (J. Biol. Chem., 1937, 119, 725—734).—Vals. for ionisable Fe by the 2:2'-dipyridyl reagent were more uniform on homogenised than on macerated liver. Interference by flavins was avoided by the use of  $\text{Na}_2\text{S}_2\text{O}_3$  or thioglycollic acid as reducing agents. Low results obtained when  $\text{Na}_4\text{P}_2\text{O}_7$  is added to liver or blood are due to partial pptn. of Fe as pyrophosphate. Evidence that only about 70% of Fe in liver is in inorg. form is presented.

J. L. C.

# BRITISH CHEMICAL ABSTRACTS

## A., III.—Biochemistry

DECEMBER, 1937.

**Optical properties of the red cell membrane.** F. O. SCHMITT, R. S. BEAR, E. PONDER (J. Cell. Comp. Physiol., 1936, 9, 89—92).—Observations of birefringence in hæmoglobin-free envelopes suggest that these consist of layers of protein mols. with long axes oriented tangentially and interspersed lipin micelles with optical axes oriented radially. M. A. B.

**Osmotic properties of the erythrocyte. VIII. Nature of influence of temperature on osmotic hæmolysis.** M. H. JACOBS, H. N. GLASSMAN, and A. K. PARPART. **IX. Effect of low concentrations of electrolytes on hæmolysis by penetrating non-electrolytes and on cell volume.** M. H. JACOBS, A. K. PARPART, and S. A. CORSON (J. Cell. Comp. Physiol., 1936, 8, 403—417; 1937, 9, 177—190; cf. A., 1936, 874).—VIII. The increased resistance of erythrocytes to hæmolysis with rise in temp. is reversible in hypotonic KCl buffered with phosphates at  $p_H$  3. In aq. NaCl there is a rapid loss of the effect in erythrocytes of certain species, possibly due to leakage of  $K^+$  from the cells. Rise of temp. causes a reversible shrinkage of erythrocytes. These results are best explained on the hypothesis of reversible changes in the base-binding powers of hæmoglobin and  $H_2CO_3$ .

**IX.** The rate of osmotic hæmolysis of ox erythrocytes in glycerol and  $(CH_2OH)_2$  solutions is increased by low concns. of electrolytes. Chlorides of Ca, Ba, Sr, and Mg are more effective than those of Na, K, and Li. The effect is ascribed to alteration of the ionic equilibrium in the cell which causes swelling.  $Na_2SO_4$ ,  $MgSO_4$ , and Na citrate retard the rate of hæmolysis. M. A. B.

**Effect of prolonged exposures to lack of oxygen on permeability of the erythrocyte.** F. R. HUNTER (J. Cell. Comp. Physiol., 1937, 10, 241—245).—Permeability of erythrocytes to  $(CH_2OH)_2$ , glycerol,  $NH_4Cl$ , and  $NH_4OAc$  is not affected by depriving the cells of  $O_2$  for long periods. M. A. B.

**Loss of potassium from the erythrocyte in hypotonic saline.** H. DAVSON (J. Cell. Comp. Physiol., 1937, 10, 247—264).—The erythrocyte membrane becomes permeable to  $K^+$  in hypotonic media, permeability increasing with rise of temp. M. A. B.

**Rate of sedimentation of erythrocytes. Vernes' reaction, induced hyperthermia, and medicinal injections in man.** C. GERNEZ (Compt. rend. Soc. Biol., 1937, 126, 50—52).—Intravenous injection of foreign substances causes an increase in the rate of sedimentation and in Vernes' optical index

of flocculation, which is more prolonged if the material is pyretic. Very little change is observed on intramuscular injection, the increases being observed only with pyretic substances. H. G. R.

**Bovine blood. I. Sedimentation rate and percentage volume of erythrocytes in normal blood.** L. C. FERGUSON (J. Amer. Vet. Med. Assoc., 1937, 44, 163—175).—The mean sedimentation index of blood for 22 cows, calc. from the individual means, is 2.394 mm. A val.  $>4$  mm. is regarded as pathological. The mean % vol. of erythrocytes is 31.32%. The relatively high fibrin content of normal bovine serum may account for the slow sedimentation rate. P. W. C.

**Effect of ascorbic acid on the sedimentation velocity of erythrocytes.** B. BARTOLINI and F. COPELLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 309—311).—Intramuscular injection of 25 mg. of ascorbic acid into rabbits or oral administration of 50 mg. per day to men significantly lowers the rate of sedimentation of the erythrocytes. F. O. H.

**Influence of temperature on the sedimentation velocity of erythrocytes.** E. CARLINFANTI and F. BALESTRIERI (Boll. Soc. ital. Biol. sperim., 1937, 12, 389—391).—Erythrocytes from normal men show an increased sedimentation velocity with rise in temp., but those from pathological cases often behave anomalously. F. O. H.

**Influence of oxygen tension on cell metabolism and the mechanism of the action of hydrocyanic acid.** C. SCHLAYER (Biochem. Z., 1937, 293, 94—98).—The action of various [HCN] on the metabolism of goose erythrocytes is investigated at normal and at low  $O_2$  tensions. At normal tensions, inhibition of respiration is accompanied by increased formation of lactic acid (I), but at low  $O_2$  tensions considerable inhibition of respiration is produced without any increase in (I). The appearance of (I) in presence of HCN is therefore not conditioned by the depressed respiration, but by a direct action of HCN on the fermentation. P. W. C.

**High urea content of the red blood corpuscles of *Sipunculus*.** M. FLORKIN and R. HOUET (Arch. Internat. Physiol., 1937, 45, 125—127).—The coelomic fluid of red corpuscles has a high urea content; the plasma and white corpuscles contain practically none. R. M. M. O.

**Chemotactic reaction of leucocytes to irritated tissues.** C. G. GRAND and R. CHAMBERS (J. Cell. Comp. Physiol., 1936, 9, 165—175).—Leucocytes are not attracted to uninjured, healthy tissues or to

normal peritoneal fluid, but infected or mechanically injured tissues produce a positively chemotactic substance, which is destroyed by heat. The chemotactic substance produced by *Staphylococcus* grown in broth is thermostable. M. A. B.

**Osmotic properties of rabbit and human leucocytes.** H. SHAPIRO and A. K. PARPART (J. Cell. Comp. Physiol., 1937, 10, 147—163).—The kinetics of swelling and shrinking of human and rabbit leucocytes are examined. Data obtained indicate the permeability consts. for endosmosis to be 1.35 for human and 0.29 for rabbit leucocytes. The consts. for exosmosis are about four times those for endosmosis. M. A. B.

**Reticulocytosis in the guinea-pig. I. Use of standard guinea-pigs in assay of anahæmin. II. Hæmatopoietic response of "reactive" guinea-pigs to anahæmin and other substances.** M. M. O. BARRIE (J. Pharm. Exp. Ther., 1937, 60, 235—244, 245—253).—I. Guinea-pigs of different stocks show considerable variation in reticulocytosis whilst those from the same stock show less variation and are separable into groups with different average reticulocyte counts. A method of assay for liver preps., using suitable groups of guinea-pigs, is suggested.

II. A reticulocyte response is produced in "reactive" guinea-pigs by histidine hydrochloride and by HCl but the response to anahæmin (a conc. liver prep.) is very much greater. E. M. W.

**Ultramicroscopic particles in normal human blood.** A. C. FRAZER and H. C. STEWART (J. Physiol., 1937, 90, 18—30).—The no. of particles visible under the dark-ground condenser in the serum of normal human subjects is increased by ingestion of fatty food. The time curves after a meal are similar for particles of all types, and have two components; an initial rise is due to intestinal movements and fat from the previous meal, whilst a delayed rise represents fat actually absorbed. Blood-fat rises and falls simultaneously with the particle content, whilst cholesterol rises and remains high. Protein meals cause no significant variations in the particle content, whilst a pure carbohydrate meal causes a rapid fall. R. N. C.

**Hæmoglobin in the Amphibia.** F. H. MCCUTCHEON and F. G. HALL (J. Cell. Comp. Physiol., 1937, 9, 191—197).—The type of hæmoglobin varies with species as shown by differences in the dissociation curves. M. A. B.

**Hæmoglobin and chlorophyll.** ANON. (Contact Point, 1935, 13, 5—9).—The porphyrin ring is both strainless and flat. A connexion between the oscillation of the relatively heavy metal atom and the shift of the H atoms and double linkings is discussed and utilised to explain the physiological activity of these compounds. CH. ABS. (p)

**Reaction between arsenic trihydride and hæmoglobin.** F. GEBERT (Biochem. Z., 1937, 293, 157—186; cf. Wolff, A., 1937, III, 29).—The solubility of  $\text{AsH}_3$  in physiological aq. NaCl, fresh and old blood-serum, protein solution, and buffer solutions is the same as in  $\text{H}_2\text{O}$  and  $\propto$  pressure.  $\text{AsH}_3$  is insol.

in conc. aq. NaOH and the solubility in acids ( $\text{HCl}$ ,  $\text{H}_3\text{PO}_4$ ) decreases as the concn. of acid increases. Hæmatin (I) reacts irreversibly with  $\text{AsH}_3$ , (I) being partly converted into hæm. Erythrocytes containing no oxyhæmoglobin and CO-hæmoglobin combine with  $\text{AsH}_3$ ; no combination occurs if the erythrocytes are first treated with  $\text{Na}_2\text{S}_2\text{O}_4$ . The combination with erythrocytes is due not to hæmoglobin (II) but probably to methæmoglobin produced by autoxidation of (II). (I) and (II) catalyse the oxidation of  $\text{AsH}_3$  by  $\text{O}_2$ . HCl inhibits catalysis by (I) and CO and KCN inhibit catalysis by (II). The first product of the oxidation is probably  $\text{As}_2\text{H}_4$ . W. McC.

**Relation of blood-cholesterol to hæmoglobin and serum-protein.** H. SCHWARZ and H. H. LICHTENBERG (J. Biol. Chem., 1937, 121, 315—321).—In rabbits rendered anæmic by bleeding daily blood-cholesterol (I) increases and hæmoglobin (II) decreases, the serum-protein (III) remaining unchanged even when the bleedings are followed by injection of serum. When bleeding and injection of serum are prolonged for >40 days (II) increases considerably and (I) decreases to approx. the initial val. Administration of egg-yolks results in lipæmia and increase in (I), (II) and (III) remaining unchanged. Since the anæmic rabbits have fatty livers, the resulting disturbance of lipin metabolism may be the cause of the lipæmia and of the increased (I). The latter does not result from synthesis of (III) produced to compensate for loss of (III) on bleeding. W. McC.

**Comparative investigation of methods of determining hæmoglobin in blood.** W. WEISE (Biochem. Z., 1937, 293, 64—93).—A spectral colorimetric method for determination of hæmoglobin (I) as reduced (I) is described, and is shown to give trustworthy results and good agreement with results by gas analysis. A similar method for determination of hæmatin is described and also iodometric and colorimetric methods for determination of Fe in 1—2 c.c. of blood. The (I) content can be calc. from the Fe content with considerable accuracy. Comparative tests by these methods with 25 samples of whole blood gave results showing good agreement. P. W. C.

**Biological oxidations. VIII. Oxidation of glutathione with copper and hæmochromogens as catalysts.** C. M. LYMAN and E. S. G. BARRON. IX. Oxidation-reduction potentials of blood-hæmin and its hæmochromogens. E. S. G. BARRON (J. Biol. Chem., 1937, 121, 275—284, 285—312; cf. A., 1937, III, 77).—VIII. The oxidation of glutathione (I) by atm.  $\text{O}_2$  is catalysed by Cu, the rate of oxidation being greater at higher  $p_{\text{H}}$  vals. A linear relationship exists between  $p_{\text{H}}$  and log of half-oxidation time. The rate of oxidation is unaffected by the degree of Cu ionisation. With hæmin as catalyst, the rate of oxidation of (I), which shows an optimum at  $p_{\text{H}}$  8, is insensitive to HCN except at high [HCN]. At  $p_{\text{H}}$  7.4, the catalytic activity of pyridine-, nicotine-, and pilocarpine-hæmochromogen decreases in this order.

IX. The oxidation-reduction potentials,  $E_0$ , of blood hæmin and of hæmochromogens in which the

affinity of the nitrogenous constituent for hæmin is low, e.g., pyridine-,  $\alpha$ -picoline-, and nicotine-hæmo-chromogen, vary with  $p_H$ , the val. of  $-dE_0/dp_H$  being 0.06 v. per  $p_H$  unit. With increasing affinity of the nitrogenous constituent the val. of  $-dE_0/dp_H$  decreases, being 0.015 v. per  $p_H$  unit for pilocarpine- and histidine- and zero for cyanide-hæmochromogen.

C. R. H.

**Spectroscopic determination of bilirubin in serum.** J. HENRY-CORNET and L. HENRY (Bull. Acad. roy. Belg., 1937, [v], 23, 697—702; cf. A., 1936, 1048).—Bilirubin (I) from different sources, when dissolved in alkali or aq. EtOH, gives the same absorption spectrum, the extinction coeff. of which is used to determine the concn. of (I) in serum de-proteinised with EtOH.

J. L. D.

**Mixtures of serum-albumin and -globulin.** A. G. OGSTON (Biochem. J., 1937, 31, 1952—1957).—The osmotic pressure, ultra-violet absorption, pptn. reactions, and potentiometric titration of the two proteins (man, horse) and their mixtures do not elucidate the phenomenon of apparent dissociation occurring during sedimentation of mixed proteins (cf. Pedersen, A., 1936, 1338).

F. O. H.

**Effect of infra-red rays on the post-traumatic blood-polypeptide curve in guinea-pigs.** P. ETIENNE-MARTIN and P. PLAN (Compt. rend. Soc. Biol., 1937, 126, 9—11).—The increase in polypeptides caused by trauma is less marked after infra-red irradiation.

H. G. R.

**Histamine-like activity of blood.** C. F. CODE and A. D. MACDONALD (Lancet, 1937, 233, 730—733).—Mainly a discussion of previous work. Histamine (I) appears to be a normal constituent of the white blood-cells. In myeloid leucæmia blood-(I) is greatly increased, and the increase appears to be fixed in the white cell layer.

L. S. T.

**Alterations of blood-amino-acids in pathological conditions.** M. R. CASTEX and P. M. RE (Presa med. Argentina, 1931, Apr. 10, 46 pp. [Sep.]).—Normal blood-NH<sub>2</sub>-acids range between 55 and 65 mg. of N per litre. Vals. obtained in CCl<sub>3</sub>-CO<sub>2</sub>H filtrates are > those given by Folin's tungstic acid method, especially in cancer, leucæmia, and CHCl<sub>3</sub> poisoning.

CH. ABS. (p)

**Composition of the blood-plasma in adult insects.** M. FLORKIN (Arch. Internat. Physiol., 1937, 45, 6—16; cf. A., 1937, III, 53, 84).—The blood-protein and -sugar of *Hydrophilus piceus* and *Bombyx mori* are similar to, whereas reducing-non-fermentable substances, uric and NH<sub>2</sub>-acids are >, those of decapodal crustaceans. *Hydrophilus* blood contains O<sub>2</sub> and the CO<sub>2</sub> content is high (72.8—88.8 vol.-%).

H. G. R.

**Plasma-lipins in actively immunised rabbits.** E. M. BOYD, J. H. ORR, and G. B. REED (Canad. J. Res., 1937, 15, D, 176—178).—No significant change occurred in the phospholipin or free cholesterol contents of the plasma after 6 weeks' active immunisation against *Streptococcus viridans*.

A. G. P.

**Variations in the composition of the blood-plasma during metamorphosis of the silkworm.**

M. FLORKIN (Arch. Internat. Physiol., 1937, 45, 17—31).—In the period from the commencement of spinning to the grub stage an increase in glycogen and a decrease in lipins were observed. Dilution of the blood occurs in the spinning stage, and concn. during the pre-grub resting period. In the chrysalis two phases are observed corresponding with a diminution and augmentation of CO<sub>2</sub>.

H. G. R.

**Determination of cholesterol in blood.** J. B. DE MELLO (Rev. quim. farm. Brazil, 1935, 1, 49—50).—The EtOH-Et<sub>2</sub>O mixture used in Sackett's method is best kept anhyd. by means of CuSO<sub>4</sub>. A second washing (5 c.c.) is preferable after decantation. Vac. distillation of the solvent is recommended, since heating affects the colour.

CH. ABS. (p)

**Cholesterolaemia in normal and diabetic Indian subjects.** J. P. BOSE and U. N. DE (Indian J. Med. Res., 1936, 24, 489—508).—Blood-cholesterol (I) in normal subjects ranges from 120 to 160 mg. %. It is apparently unaffected by race *per se*. (I) in diabetics shows very little relation to the degree of hyperglycæmia, although this may be moderate in cases where (I) is high, and high where (I) is normal. (I) is a more satisfactory index of the severity of the diabetic condition than hyperglycæmia or any other factor.

R. N. C.

**Acetylcholine in blood.** A. FLEISCH, I. SIBUL, and M. KAELIN (Arch. Internat. Physiol., 1936, 44, 24—34).—Acetylcholine is never present in normal venous blood, but appears if the blood pressure is lowered.

H. G. R.

**Phenol and glyoxaline content of the blood.** E. G. SCHMIDT, M. J. SCHMULOVITZ, A. SZCZPIŃSKI, and H. B. WYLIE (J. Biol. Chem., 1937, 120, 705—717).—Determination of the "diazo-val." of blood by three methods shows that <1% of the total val. is made up of Et<sub>2</sub>O-sol. phenols, the remainder being due presumably to N compounds. Differences in the diazo-val. are obtained by using *p*-NH<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·NO<sub>2</sub> and *p*-NH<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·SO<sub>3</sub>H as reagents. The use of histidine instead of PhOH for the colour standard is suggested.

A. L.

**Determination of phenols in blood.** A. F. ARNAUDO (Prensa med. Argentina, 1934, Aug. 8th, 55 pp. [Sep.]).—A review. Theis and Benedict's method is recommended.

CH. ABS. (p)

**Effect of vagotomy on blood-sugar curves produced by glucose or insulin.** A. O. ETCHÉVERRY (Compt. rend. Soc. Biol., 1937, 126, 147—149).—The vagus augments secretion of insulin during hyperglycæmia and diminishes it during hypoglycæmia.

H. G. R.

**Normal and alimentary blood-sugar levels during menstruation.** R. ROMANIELLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 352—353).—Both levels are max. and min. during the menstrual and intermediate periods, respectively.

F. O. H.

**Self-regulation of blood-glycolysis and coupling of its chief oxido-reduction process with the synthesis of difficultly hydrolysable phosphoric esters.** Z. DISCHE (Naturwiss., 1937, 25, 650—651).—Human erythrocytes incubated with glucose

and then haemolysed cause hexose diphosphate to disappear more slowly than when glucose is absent. The effect is due to an increase in the dehydrogenase activity which increases the rate of the reaction between  $\text{AcCO}_2\text{H}$  and triose phosphate (I). The reaction of (I) and  $\text{AcCO}_2\text{H}$  in presence of haemolysate is coupled with the esterification of inorg. P, resulting in an increase of  $\text{P}_2\text{O}_7^{4-}$ -P (II) and also of difficultly hydrolysable phosphate; in presence of adenylic acid, however, only (II) increases. The theoretical significance of these results is discussed with special reference to the possible activation during incubation of an inactive precursor of the co-enzyme. W. O. K.

**Oxidation-reduction potential of serum and of the dehydroascorbic-ascorbic acid system.** B. BARTOLINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 303—305).—Serum oxidises ascorbic acid (I) to dehydroascorbic acid (II) or reduces (II) to (I), the ratio (I):(II), which is affected by  $p_{\text{H}}$  and exposure to light, affording an index of the oxidation-reduction potential of the serum. F. O. H.

**Electrometric determination of esterase activity of blood.** C. CATTANEO and G. SCOZZ (Boll. Soc. ital. Biol. sperim., 1937, 12, 280—281).—The esterase activity is measured by the vol. of 0.05N-NaOH required to adjust the  $p_{\text{H}}$  of a system containing tributyrin (1 c.c.), 2% aq.  $\text{CaCl}_2$  (0.5 c.c.),  $\text{NH}_3\text{--NH}_4\text{Cl}$  buffer at  $p_{\text{H}}$  8 (2.5 c.c.), and the sample of serum (1 c.c.), kept at 37.5° for 1 hr., to its original val. F. O. H.

**Effect of the lung on the lactic acid content of the blood.** H. ROSENBAUM (Arch. Internat. Physiol., 1937, 45, 75—83).—The lactic acid content of venous is > that of arterial blood. H. G. R.

**Rate of removal of urea by living blood capillaries from extravascular solutions in transparent moat chambers introduced into the rabbit's ear.** R. G. ABELL (Anat. Rec., 1937, 69, 11—31).—The rate of removal follows the law of simple diffusion, and  $\propto$  the concn. gradient. The rate of decrease in concn. in the extravascular solution due to diffusion  $\propto$  the concn. gradient and the absorbing capillary area, and inversely  $\propto$  the vol. of the solution. R. N. C.

**Effect of calcium salts on the fat content of the blood.** W. VON MORACZEWSKI and H. JANKOWSKI (Biochem. Z., 1937, 293, 187—191; cf. A., 1931, 1086).—In man and in the dog increase of short duration in the fat and cholesterol contents of the blood follows oral or intravenous administration of Ca salts [ $\text{CaCl}_2$ ,  $\text{Ca}_3(\text{PO}_4)_2$ ] or injection of parathyroid extract. The action of less sol. is more prolonged than that of more sol. Ca salts. W. McC.

**Effect of hydrogen-ion concentration on determination of calcium in blood-serum-phosphomolybdic acid centrifugates.** J. H. DEFANDORF (J. Lab. Clin. Med., 1935, 21, 65—67).—Hermann's method (1932) is unsatisfactory for determining Ca not bound to protein. Addition of definite quantities of phosphomolybdic acid does not always produce the  $[\text{H}^+]$  necessary for complete pptn. of protein. Vals. given by  $\text{KMnO}_4$  titration are too high if protein is incompletely pptd. or if bound Ca is separated from

protein by a  $[\text{H}^+] >$  the min. required for complete pptn. of protein. CH. ABS. (p)

**Micro-determination of sulphur in normal blood-serum.** L. RÉVOL (Compt. rend. Soc. Biol., 1937, 126, 22—24).—The method of Revol and Ferland (A., 1936, 126) has been applied. The average vals. of total and non-protein-S for normal serum are 1190 and 62 mg. per litre, respectively. H. G. R.

**Various forms of sulphur in therapeutic sera. Determination of inorganic sulphur.** L. RÉVOL and L. TROUVILLAS (Compt. rend. Soc. Biol., 1937, 126, 24—25).—No variation in the distribution of S between normal and therapeutic horse sera was observed. Horse serum contains less total S (1 g. per litre) but more non-protein (190 mg. per litre) and inorg. S (64—72 mg. per litre) than human sera. H. G. R.

**[Simulation of] post-operative hypochloræmia [by injection of muscle extract].** A. SALVATORI (Atti R. Accad. Lincei, 1937, [vi], 25, 404—412).—Aq. muscle extract injected into the gluteal region of adult rats causes hypochloræmia (in 7 out of 10), and an increase in non-protein-N in the blood. This supports the view that post-operative hypochloræmia is due to the liberation of toxic N compounds in the traumatised tissues. There is, however, no apparent proportionality between the amount of the injection and the degree of hypochloræmia. E. W. W.

**Iodine content of blood.** E. J. BAUMANN and N. METZGER (J. Biol. Chem., 1937, 121, 231—234; cf. A., 1933, 198).—Blood-I is determined by digesting with  $\text{CrO}_3$  and  $\text{H}_2\text{SO}_4$ , adding a large amount of  $\text{H}_2\text{C}_2\text{O}_4$ , and distilling in a slow current of air. The distillate is collected in aq. KOH, concentrated, neutralised, treated with Br, and titrated with 0.001N- $\text{Na}_2\text{S}_2\text{O}_3$ . Vals. for healthy men averaged 0.0035 and for women 0.0026 mg. per 100 c.c. The val. is not affected by administration of thyroid gland but in Graves' disease and in health is increased (sometimes very greatly) by administration of I or KI. W. McC.

**Blood-iodine.** T. LEIPERT (Biochem. Z., 1937, 293, 99—106).—A method for determining various fractions of blood-I is described. Iodised protein is separated by ultrafiltration and the inorg. I of the ultrafiltrate removed by  $\text{Ag}_2\text{SO}_4$ . In blood ultrafiltrate, 1—3  $\times 10^{-6}\%$  of I is present in org. combination. Its importance is discussed. P. W. C.

**Microchemical reactions for detecting constituents of blood and urine.** K. NOSAKA (Mikrochim. Acta, 1937, 1, 78—82).—Blood in urine is detected by treating a drop of urine, on filter-paper, with  $\text{H}_2\text{O}_2$  and benzidine; the sensitivity is augmented by adding a drop of NaOH. Tyrosine in urine or serum is detected by the purple colour produced on deproteinising with  $\text{CCl}_3\text{CO}_2\text{H}$ , and treating the solution with 1:2- $\text{NO}\cdot\text{C}_{10}\text{H}_7\text{OH}$ . Leucine is similarly detected by the characteristic habit of the cryst. compound formed with  $\text{Cu}(\text{OAc})_2$ . Urine is first decolorised with C; serum, or urine containing protein, is treated as above. J. S. A.

**Congo-red test for amyloidosis.** M. M. FRIEDMAN and O. AUERBACH (J. Lab. Clin. Med., 1935,

21, 93—94).—Blood samples are taken 4 min. and 1 hr. after injection of Congo-red. Hæmoglobin is removed by addition of four times the vol. of EtOH and the extent of the dye adsorption judged colorimetrically from the two samples. CH. ABS. (p)

Suitability of the corneal epithelium of the frog for the detection of mitogenetic radiation from the blood. W. BRENNER (Biochem. Z., 1937, 292, 424—433).—Variations in response indicate that the frog's corneal epithelium is unsuitable.

F. O. H.

Heart-lung-kidney preparation with coagulable blood. L. BRULL (Arch. Internat. Physiol., 1936, 44, 1—14).—Utilisation of a second heart-lung prep. overcomes the lack of a reserve of venous blood. With this prep. the non-protein-N of the blood is conc. 10—12-fold by the kidney and urinary Cl and P are > when using defibrinated blood, although these are not excreted at a concn. > that of the plasma.

H. G. R.

Blood-groups of Veddahs. W. C. O. HILL (Nature, 1937, 140, 548).—Blood-groups of Ceylonese peoples are tabulated.

L. S. T.

Photodynamic hæmolysis. I. Effect of dye concentration and temperature. H. F. BLUM, N. PACE, and R. L. GARRETT. II. Modes of inhibition. H. F. BLUM (J. Cell. Comp. Physiol., 1937, 9, 217—228, 229—239).—Rose-bengal (I) in low concn. causes true photodynamic hæmolysis with a temp. coeff. of 1.2. In high concn. it produces hæmolysis in the dark and, in this case, the effect of temp. is irregular.

II. Photodynamic hæmolysis by (I) is inhibited by  $\text{SO}_3^{''}$ ,  $\text{S}_2\text{O}_3^{''}$ , blood-plasma, phenosafranine (II), tryptophan (III), and histidine (IV). Plasma, (II), (III), and (IV) also inhibit hæmolysis in the dark. Inhibition results from (a) interference with the photo-oxidation process, either by removal of  $\text{O}_2$  or by introduction of reducing substances, (b) introduction of substances which prevent the combination of the dye with the cells. (a) will inhibit only photodynamic hæmolysis; (b) will inhibit hæmolysis both in the light and in the dark.

M. A. B.

Intensified hæmolysis. P. NEUDA (Z. Immunitats., 1937, 91, 112—133).—Human serum contains a "normal" lysing agent the action of which is weakened by addition of lecithin (I) to the serum. When (I) is added to the red corpuscles lysis is increased. This agent is most active at low temp., and is thermostable. The optimum dilution is 1:16 to 1:64.

C. R. S.

Hæmolysis by the venom of the Indian cobra (*Naja tripudians*). S. N. GANGULY (Indian J. Med. Res., 1937, 24, 1165—1174).—The hæmolytic action is associated with a fraction of the venom containing globulin and primary proteose, and accompanied by lecithinase. The % hæmolysis of whole blood by the fraction is roughly inversely  $\propto$  the cholesterol (I) content. Hæmolysis in general is slight when (I) is lecithin; this relationship is not shown in the case of washed cells.

R. N. C.

Chemistry of moccasin [snake-]venom. I. Hæmorrhagic and hæmolytic components. S. M. PECK and W. MARX (J. Pharm. Exp. Ther., 1937, 60, 358—368).—Tests for hæmorrhagin (I) and hæmolysin (II) in the venom are described. The optimum  $p_H$  for (I) is 6.0—8.0 and that for (II) 5.0—7.0. Incubation for 3 hr. at 60° destroys (I) and (II), at 37° (II) only.

E. M. W.

Preservation of coagulant solutions of daboia-venom. J. TAYLOR, S. M. K. MALLICK, and S. N. GANGULY (Indian J. Med. Res., 1936, 24, 521—524).—The venom may be preserved by 50% glycerol.

R. N. C.

Coagulability of blood from the site of surgical lesions. I. SCALONE (Riv. Biol., 1937, 23, 89—127).—The main factor in the increase in coagulability of blood from the site of various types of trauma in men and animals is blood stasis in the vessels. Inflammation and sepsis, but not inoculation or absorption of neoplastic tissue, increase the rate of coagulation. The relationships of coagulability to various pathological conditions are discussed.

F. O. H.

Action of hydrotropic substances on fibrinogen and blood-clotting. I. MEISSNER and E. WOLLSCH (Biochem. Z., 1937, 293, 133—141).—Addition of various hydrotropic substances, e.g., urea, NaOBz, and Na hippurate, to fibrinogen (I) solutions decreases, and of Na salicylate in small concns. increases, but with higher concns. decreases, their turbidity. The action is reversible. Urea in high concns. retards the spontaneous denaturation of (I) and the clotting of (I) by thrombin, whilst various hydrotropic substances retard the pptn. of (I) by EtOH, tannin, NaCl, AcOH, and heat. With EtOH, tannin, and heat, the effect is a delay of flocculation and not of denaturation. Urea does not inhibit the hydrolysis of (I) by pepsin and trypsin.

P. W. C.

Clotting time of blood following administration of histidine. L. BLOCH, J. KOSSE, and H. NECHELES (J. Amer. Med. Assoc., 1937, 109, 204).—Histidine has no effect on blood clotting time and its therapeutic use in bleeding peptic ulcers cannot be justified.

J. N. A.

Anticoagulants. T. MAGATH and M. HURN (Amer. J. Clin. Path., 1935, 5, 548—567).—Heparin (I) causes no crenation or swelling of erythrocytes. Dry oxalate (22 mg. per 10 c.c. of blood) causes 11.3% shrinkage. Use of 1 c.c. of 1.1% aq.  $\text{Na}_2\text{C}_2\text{O}_4$  per 5 c.c. of blood leads to hæmatocrit readings agreeing with those obtained with (I), provided blood is centrifuged within 2 hr.

CH. ABS. (p)

Complement content of sera of the new-born, infants, and foetus. P. SOLLING (Z. Immunitats., 1937, 91, 15—21).—The hæmolytic complement val. was const. in the case of 20 infants in their first year and 93 new-born, in which it was < in healthy men. The complement could be detected from the 17th week of foetal life, but had a low val. After the 28th week it had risen to that of a new-born infant.

C. R. S.

Interpretation of secretion and non-secretion of substances belonging to serological groups. V. FRIEDENREICH (Z. Immunitats., 1937, 91, 39—49).—An A-substance is found in the saliva of some

but not of all horses. It is never found in red corpuscles. C. R. S.

**Toxin of *Bacterium coli*. II. Immunising power of the polysaccharide and the curve of the agglutination titre. III. Action of anti-polysaccharide serum on the polysaccharide and on the living bacteria.** A. LIGAS (Boll. Soc. ital. Biol. sperim., 1937, 12, 297—298, 298—299; cf. A., 1937, III, 397).—II. Data are given for the febrile reaction, agglutinin titre of the serum, and bactericidal power of rabbit blood following intravenous injection of the polysaccharide (I).

III. The antipolysaccharide serum probably contains an antibody which diminishes the toxic action of (I) and of the living bacteria. F. O. H.

**Detoxication of diphtheria toxin by lanoline and sterols; influence of cholesterol on its immunising power. II.** M. EISLER and F. GOTTDENKER (Z. Immunitats., 1937, 91, 49—61).—The toxin previously neutralised by combination with cholesterol (I) regains its toxicity when the (I) is extracted with  $\text{CHCl}_3$ . Rabbits can decompose this combination. Neutralisation of the toxin by (I) depends on the ratio of their vols. and on the period of reaction allowed. The quantity of antitoxin formed increased after injection, simultaneous or separate, of toxin and (I). C. R. S.

**Highly purified diphtheria antigen.** H. THEORELL and G. NORLIN (Z. Immunitats., 1937, 91, 62—68).—Cataphoresis shows that the flocculating antigen purified by repeated pptn. is a protein, giving a negative Molisch reaction. C. R. S.

**Evaluation of the toxoid of staphylococci.** H. SCHMIDT (Z. Immunitats., 1937, 91, 75—86).—If a toxin-antitoxin mixture is added to the toxoid, part of the antitoxin is fixed and the amount may be measured by the hæmolytic effect of the freed toxin on the red corpuscles of rabbits. C. R. S.

**Hæmagglutination with night birds of prey (*Strigidae*, owls).** P. DAHR (Z. Immunitats., 1937, 91, 97—111).—No isoagglutination among owls was found; the sera contain anti-species agglutinins or type-sp. agglutinins  $\alpha$  and  $\beta$  as shown by their behaviour towards human red corpuscles. Owl corpuscles have not A, B, M, or N factors. C. R. S.

**Autoagglutination.** E. POULSEN (Z. Immunitats., 1937, 91, 134—144).—Reports that sera of patients with cancer, thrombophlebitis, etc. show autoagglutination could not be confirmed. C. R. S.

**Production of "purified" solutions of hæmagglutinins.** P. DAHR (Z. Immunitats., 1937, 91, 149—153).—A simple process is described. C. R. S.

**Slow-drying antigen for the *Brucella* rapid agglutination test.** I. F. HUDDLESON (J. Amer. Vet. Med. Assoc., 1937, 43, 519—520).—The ordinary antigen is modified by the incorporation of glycerol. W. O. K.

**Antigenic value of purified serum-proteins.** S. STETKIEWICZ (Compt. rend. Soc. Biol., 1937, 126, 141—142).—The globulin fraction gives better results

than the albumin, and the purified proteins, being less toxic, can be given in larger doses. H. G. R.

**Preparation of Krueger undenatured bacterial antigens.** H. M. POWELL and W. A. JAMIESON (J. Lab. Clin. Med., 1935, 21, 301—307).—Krueger's method is adapted for large-scale production of the antigens. Methods of standardising the products are given. CH. ABS. (p)

**Effect of disinfectants on different receptors.** K. AOKI (Z. Immunitats., 1937, 91, 87—96).—Absorption and immunising effects show that the  $\beta$ -sp. receptors are more sensitive than the  $\beta$ -unsp. ones, whilst the  $\alpha$ -receptors are intermediate in their resistance towards heat or treatment with disinfectants. C. R. S.

**Antitoxic properties of glutathione. Cobra venom.** L. BINET, G. WELLER, and C. JAULMES (Compt. rend., 1937, 204, 1513—1514).—Development of symptoms is retarded and the animals occasionally survive normally lethal doses, if the venom before injection is mixed with reduced glutathione at  $p_H$  7.4—8.4; at  $p_H$  < 7.4, animals die but less rapidly than the controls. R. M. M. O.

**Serological effect and composition of proteins of some filtrates of immune sera.** S. WENT and L. SARKADY (Z. Immunitats., 1937, 91, 157—164).—Immune sera after ultrafiltration show altered dispersibility. No relation could be found between immunising agent and coarsely dispersed proteins of the sera. C. R. S.

**Chemical and immunological mechanism of anthrax infection and immunity.** I. G. IVÁNOVICS and V. BRUCKNER (Z. Immunitats., 1937, 91, 175—176; cf. A., III, 294).—The acid found in the sp. substance is  $d(-)$ -glutamic acid. C. R. S.

**Rabidical substances in treated patients.** J. DODERO (Ann. Inst. Pasteur, 1937, 59, 382—402).—Substances appear transitorily in the serum during treatment. Their presence is indicated by a prolonged incubation period or survival in animals injected with the serum. The extent of their formation depends on the individual and probably also on manner of treatment. No clear relation emerges between these substances and the protective affect of the treatment. R. M. M. O.

**Destruction of anaphylactic supersensitiveness to azoprotein by azo-dyes from *p*-aminophenyl-arsinic acid.**—See A., II, 528.

**Changes in human tissue electrolytes in senescence.** H. S. SIMMS and A. STOLMAN (Science, 1937, 86, 269—270).—Human tissues > 70 years of age contained more  $\text{H}_2\text{O}$ , Cl, total base, Na, and Ca and less K, Mg, P, N, and ash than tissues 30—40 years of age. Pathological abnormalities in young tissue were similar to but less marked than those of senescence. Ca variations were exceptional. L. S. T.

**Distribution of chloride in frog's skeletal muscle immersed in saline solution.** M. G. EGGLETON, P. EGGLETON, and A. M. HAMILTON (J. Physiol., 1937, 90, 167—182).—[Cl<sup>-</sup>] in isolated muscle in equilibrium with Ringer's solutions of

const.  $[Cl']$  but varying osmotic pressure is inversely  $\propto [H_2O]$ . The  $[Cl']$  ratio between muscle and isotonic Ringer's solution is const. for all  $[Cl']$  vals. in the latter between 0.5 and 4.4 mg. per c.c.; it is 0.24 in living muscle, and 0.85 in rigor. It is concluded that only a quarter of the muscle is permeable to  $Cl'$ . An electrometric titration method for determination of  $Cl'$  is described; it can be applied to  $CCl_3 \cdot CO_2H$  filtrates of tissues and is not interfered with by glycogen, protein, or other N compounds of muscle.

R. N. C.

**Determination of iodine in thyroid gland.** J. C. DE JONG (Pharm. Weekblad, 1937, 74, 1429—1437).—200 mg. of the powdered gland are dissolved in 5 c.c. of warm 4N-NaOH, 200 mg. of talc, 50 c.c. of 4% aq.  $KMnO_4$ , and 25 c.c. of 4N- $H_2SO_4$  are added. The mixture is warmed until it foams and, after the initial reaction, gently boiled for 5 min. to complete oxidation. The cooled solution is treated with an excess (3 g.) of  $NaHSO_3$  and 3 c.c. of 0.1N- $AgNO_3$ , boiled free from  $SO_2$ , and 15 c.c. of 50%  $HNO_3$  are added. The ppt. of  $AgI$  and talc is washed on a hardened filter and transferred to a flask with 75 c.c. of  $H_2O$ .  $I'$  is oxidised to  $IO_3'$  with 5 c.c. of dil.  $H_2SO_4$  and 10 c.c. of  $Br-H_2O$ . The excess of  $Br$  is removed by boiling, 5 c.c. of 1% aq.  $PhOH$  and a few crystals of  $KI$  are added, and the liberated  $I$  is titrated with 0.01N- $Na_2S_2O_3$  (1 c.c. = 0.212 mg.  $I$ ). The method compares favourably with the standard method. Several commercial samples analysed did not fulfil the requirements of the Dutch Pharmacopœia. S. C.

**Fluorine in dental enamel.** A. BERNARDI and L. SCANDOLA (Annali Chim. Appl., 1937, 27, 328—332).—Qual. analysis by the  $La(OAc)_3$  method indicates the occurrence of  $F$  in dental enamel (man, ox); the average content is 0.38 and 0.54%, respectively.

F. O. H.

**Chemical constitution of enamel and dentine. I. Principal components.** W. D. ARMSTRONG and P. J. BREKHUS (J. Biol. Chem., 1937, 120, 677—687).—Analytical vals. are reported for the mineral constituents of enamel and dentine. The  $Mg$  and  $CO_3''$  contents of dentine being  $>$  those in enamel indicate the non-identity of the two mineral phases. The composition of the enamel of carious teeth is similar to that of sound teeth, and the composition of the enamel from the teeth of one individual varies as much as that obtained from the teeth of several.

A. L.

**Natural occurrence of zinc in teeth. II. Some general considerations.** D. B. CRUICKSHANK (Brit. Dental J., 1937, 63, 395—399).—Of all human organs, the teeth have the highest concn. of  $Zn$  (200 mg. per kg.).

W. O. K.

**Copper, zinc, and cobalt in organs of lamelli-branchs.** R. PAULAIS (Compt. rend., 1937, 204, 1508—1510).— $Zn$ ,  $Cu$ , and, in most cases,  $Co$  were found in the species examined.

R. M. M. O.

**Radioactivity of potassium prepared from animal tissue.**—See A., I, 489.

**Micro-determination of chloroform extract of beet leafhopper.** R. A. FULTON (Ind. Eng. Chem., Anal., 1937, 9, 437—438).—An apparatus for quant.

extraction of small wts. of the insects with  $CHCl_3$  is described. Dried *Eutettix tenellus* from four host plants contained 34.5—42.7% of  $CHCl_3$ -sol. material.

R. S. C.

**Liver-lipins in normal dogs on different types of fat, with and without added lecithin.** S. H. RUBIN, C. H. PRESENT, and E. P. RALLI (J. Biol. Chem., 1937, 121, 19—26).—When divided into five classes according to the type of fat added to the basal diet, the total lipins and the individual fractions (unsaponifiable, total acids, phospholipin, free and esterified cholesterol, neutral fat) of the livers of 33 normal dogs, determined by microgravimetric methods, show no significant differences (except for the  $I$  val. of the total fatty acids) amongst the classes.

P. W. C.

**Solubility of cholesterol in bile-salt solutions.** J. T. BASHOUR and L. BAUMAN (J. Biol. Chem., 1937, 121, 1—3).—The solubility of cholesterol in bile-salt solutions increases with increase in concn. of the latter to max. vals., which are more rapidly attained with deoxycholates than with cholates. Solutions of unconjugated salts appear to be better solvents than those of conjugated salts. Coupling with  $NH_2$ -acids decreases the solvent effect of cholic and deoxycholic acids.

C. R. H.

**Absorption spectra of compounds related to the sterols.**—See A., I, 494.

**Glutamic acid. I—IV.** B. ROKUSHO, R. TANAKA, and H. SAITO (J. Agric. Chem. Soc. Japan, 1937, 13, 916—953).—The relationship between  $[HCl]$ , time of decomp., and rate of hydrolysis of a soya-bean protein prep. in regard to total and  $NH_2-N$  in the hydrolysate has been determined. The optimum conditions for obtaining glutamic acid ( $I$ ) (97—99% purity) from the prep. have been determined. ( $I$ ) is liberated more slowly from the protein mol. than are the other  $NH_2$ -acids. The yield of ( $I$ ) from various oil cakes produced in Manchuria is given.

J. N. A.

**Determination of proline in gelatin.** A. BASTIAN (Bull. Soc. Chim. biol., 1937, 19, 1298—1301).—The proline content of gelatin determined in the hydrolysate by the method of Engeland and Bastian (A., 1937, III, 374), which uses only 2 g. of protein, is 25—26.5% and compares favourably with the val. of 20% obtained by Bergmann's method (A., 1935, 1140), which requires 100 g. of protein.

P. W. C.

**Protamine of the rainbow trout.** K. FELIX and A. MAGER (Z. physiol. Chem., 1937, 249, 124—125; cf. A., 1936, 1544).—The Me ester hydrochloride of the impure protamine, iridin, mol. wt. approx. 1560, of the spermatozoa of the rainbow trout contains total  $N$  22.3,  $Cl$  14.15, and  $OMe$  1.98%. The total  $N$  is distributed as follows: as arginine 86.95,  $(NH_2)_1$ -acid 13.7, alanine 2.08, serine 2.02,  $:NH$  6.11, and valine 3.50%.

W. McC.

**Compounds of clupein with prosthetic groups.** K. FELIX and A. MAGER (Z. physiol. Chem., 1937, 249, 126—134; cf. A., 1936, 1544).—At  $p_H$  4.3 the Me ester hydrochloride of clupein ( $I$ ) mixed with aq. insulin ( $II$ ) yields a  $Cl$ -free salt containing equimol. amounts of ( $I$ ) and ( $II$ ) ( $S$  content 2.8%). 1 mg. of

the salt has the same activity as 12 international units of (II). The salt is inactivated by digestion with activated trypsin or pepsin + HCl. Similar salts are obtained from (I) and adenylic acid (III), hæmin (IV), hæm (V), protoporphyrin (VI), ascorbic acid (VII), and lactoflavinphosphoric acid (VIII). The mol. ratio of (I) to the other constituent in the salts with (III)—(VI) is 1 : 11 and in that with (VII) 1 : 10. The absorption spectra of the salts with the blood pigments [except (IV)] closely resemble those of the free pigments. The enzymic activity of the (VIII) salt is double that of free (VIII). The salts with the blood pigments are almost insol. and cannot be separated into their constituents without decomp. Their catalase activity is > that of the free pigments.

W. McC.

**$\alpha$ - and  $\beta$ -caseinogen.** K. KONDO and T. YAMADA (J. Agric. Chem. Soc. Japan, 1937, 13, 791—804).—Fractional pptn. by EtOH of caseinogen (I) (goat's milk) dissolved in 40% urea solution yielded  $\alpha$ - and  $\beta$ -(I) which correspond with the two fractions obtained by Grøh (A., 1934, 1119).  $\alpha$ -(I) is insol. in 60—70% EtOH and has a high content of tyrosine, tryptophan, basic N, and P, whilst  $\beta$ -(I) is sol. in 60—70% EtOH and has a low content of the above constituents.

J. N. A.

**Composition of tissue-proteins. II. Determination of arginine.** S. GRAFF, E. MACULLA, and A. M. GRAFF. **III. Arginine in the placenta.** S. GRAFF and A. M. GRAFF. **IV. Determination of cystine.** S. GRAFF, E. MACULLA, and A. M. GRAFF (J. Biol. Chem., 1937, 121, 71—77, 79—80, 81—86; cf. A., 1935, 1044).—The determination of small amounts (0.5—1.5 mg.) of arginine (I) in protein hydrolysates by means of its quant. conversion by arginase into ornithine and urea followed by determination of the urea by the xanthhydrol method is described.

**III.** The (I)-N val. expressed as % of the total N of human placentas (normal, premature, and diseased) was 14.4—15.3 and of guinea-pigs' placentas 14.7 to 15.1%. The (I) content of the human placenta-protein is therefore not unique and is consistent with the histology of the placenta.

**IV.** A micro-determination of cystine involves hydrolysis of the protein, reduction (Zn-HCl) of the cystine, filtration from humin and excess of Zn, pptn. as Cu mercaptide, and digestion by the Kjeldahl procedure or ignition for S determination.

P. W. C.

**Optical properties of vertebrate nerve axons as related to fibre size.** F. O. SCHMITT and R. S. BEAR (J. Cell. Comp. Physiol., 1937, 9, 261—273).—The birefringence of the sheath of axons from frog sciatic nerve increases with increasing fibre diameter due to the progressive increase in amount of lipid dispersed with the protein in the sheath. A change from proteotropic to myelotropic character occurs at a diameter of about 2  $\mu$ , which corresponds with the size found by histological methods for the dividing line between non-myelinated and myelinated fibres.

M. A. B.

**Optical properties of the axon sheaths of crustacean nerves.** R. S. BEAR and F. O. SCHMITT (J. Cell. Comp. Physiol., 1937, 9, 275—287).—The

metatropic reversal of birefringence in crustacean axon sheaths produced by immersion in conc. solutions of various substances is due to the presence of a thin layer of oriented lipid material around the axis cylinder. Reduction of the positive birefringence of the oriented protein micelles in the sheath by increasing the  $n$  of the surrounding medium allows the negative intrinsic birefringence of the lipids to become evident. Preliminary treatment with lipid solvents prevents reversal by the usual agents.

M. A. B.

**Birefringence of nerve sheaths as studied in cross-sections.** P. CHINN and F. O. SCHMITT (J. Cell. Comp. Physiol., 1936, 9, 239—296).—Birefringence of frog, cat, and lobster nerve axons, treated with EtOH to remove lipids from the sheath, shows that the micelles in the protein lamellæ of the sheath are oriented to some extent.

M. A. B.

**Electrokinetic theory in the calculation of the charge on proteins.**—See A., I, 615.

**Colloid-chemical studies on meat proteins.**—See B., 1937, 1263.

**Phosphatides in healthy and diseased hearts.** F. F. URBAN (Biochem. Z., 1937, 293, 264—279).—Fresh healthy and diseased human hearts contain, on the average, 64 mg. of phosphatide-N per 100 g. Of this amount 29% is present as choline, 49% as  $\text{NH}_2$ -N, and 22% in some unknown state of combination. If the last fraction is left out of account the N : P ratio is 1.5 : 1. The hearts contain small amounts of creatinine and possibly traces of purine.

W. McC.

**Phosphatides and cerebroside.** G. FAWAZ, H. LIEB, and M. K. ZACHERL (Biochem. Z., 1937, 293, 121—132).—The phosphatides of human brain are completely extracted by treating with  $\text{CCl}_3\text{CO}_2\text{H}$ , removing the sol. portion, and boiling the insol. residue for 6 min. with EtOH. About 80% of the total P of the EtOH extract is sol. in  $\text{Et}_2\text{O}$  and the N : P ratio for the  $\text{Et}_2\text{O}$ -sol. material is 2.04—2.56 : 1. Modification of the method permits the determination also of cerebroside in the same extract. The method is applicable to the determination of phosphatide in yeast.

P. W. C.

**Lysolecithin and tosylglycerides.** P. A. LEVENE and C. L. MEHLTRETTER (Enzymologia, 1937, 4, Part II, 232—238).—The lysolecithin (I) prepared by the action of cobra venom on egg-yolk is derived mainly (>86%) from  $\beta$ -glycerophosphoric acid. Tri-*p*-toluenesulphonylglyceride with NaI gives *p*- $\text{C}_6\text{H}_4\text{MeSO}_3\text{Na}$  (II). *p*- $\text{C}_6\text{H}_4\text{MeSO}_2\text{Cl}$ , glycerol  $\alpha$ -Me ether, and  $\text{C}_5\text{H}_5\text{N}$  afford di-*p*-toluenesulphonyl- $\alpha$ -methylglyceride which with NaI gives (II). Oxidation of Ba  $\alpha$ -glycerophosphate,  $\alpha'$ -distearyl glyceride, or (I) gives  $\text{AcCHO}$ . Methylation products of (I) include Me stearate, palmitate, and glycerophosphate. The position of the fatty acid in  $\alpha$ -(I) was not elucidated.

F. O. H.

**Partial synthesis of muscle-adenylic acid.**—See A., II, 481.

**Constitution of adenosinetriphosphoric acid.** II.—See A., II, 481.

**Neurotoxins from venom of species of cobra.** F. MICHEEL, H. DIETRICH, and G. BISCHOFF (Z. physiol. Chem., 1937, 249, 157—175; cf. A., 1936, 893).—Dil. solutions of the venom of *Naja flava* after subjecting to dialysis, ultrafiltration, and cataphoresis at 20—25° (3000—3500 v., >20 ma.) in a special apparatus yield two neurotoxins of which the min. lethal doses for mice are (I) 0.001 and (II) 0.00003 mg. per g., respectively. (II) is unstable even in absence of air. The venom of *Naja tripudians* yields a neurotoxin similar to (II), the min. lethal dose being 0.00008 mg. per g., and a cryst. neurotoxin (III) containing inorg. matter (probably ZnO). The min. lethal dose of (III) is 0.006—0.009 mg. per g. The neurotoxins are inactivated by  $\text{Cu}_2\text{O} + \text{O}_2$  in presence of glutathione or cysteine (IV) (which is probably converted into cystine), but not by  $\text{Cu}_2\text{O}$  alone or (IV) alone. Glycerol, glycine, and  $\text{H}_3\text{BO}_3$  prevent the inactivation.  $\text{HSO}_3^-$  inactivates the neurotoxins with liberation of SH groups.

W. McC.

**Production of hypertensive substances during autolysis of the kidney.** E. DICKER (Compt. rend. Soc. Biol., 1937, 126, 88—89).—Aseptic autolysis *in situ*, caused by ligaturing the renal artery for 24 hr., produces substances with peripheral hypertensive action.

H. G. R.

**Photo-labile pigments of the chicken retina.** G. WALD (Nature, 1937, 140, 545—546).—Rhodopsin and the photo-labile pigment of the cones, hitherto unknown, have been extracted from chicken retinas. The cone pigment, now named iodopsin, is apparently violet in colour.

L. S. T.

**Ovoverdin, a pigment chemically related to visual purple.** K. G. STERN and K. SALOMON (Science, 1937, 86, 310—311).—The green,  $\text{H}_2\text{O}$ -sol. pigment of the egg of the lobster (*Homarus americanus*) is a carotenoid-protein, and is named *ovoverdin* (I). Aq. solutions give absorption bands centring around 6400 and 4700 Å. The isoelectric point is at  $p_{\text{H}}$  6.7 approx.; mol. wt.  $\sim 3 \times 10^5$ .  $\text{EtOH}$ ,  $\text{COMe}_2$ ,  $\text{CHCl}_3$ ,  $\text{C}_6\text{H}_5\text{N}$ ,  $\text{C}_6\text{H}_6$ , and dioxan, but not light petroleum, rapidly liberate the orange-red carotenoid from the pigment and the protein is coagulated. (I) is stable at  $p_{\text{H}}$  4 to 8.  $\text{AcOH}$  and alkali liberate the carotenoid. (I) is stable towards dil. but not conc. aq.  $\text{NH}_3$ . It is more stable than visual purple. Solutions or films of (I) prepared with gelatin bleach to a straw-yellow shade when exposed to diffuse daylight for 1—2 days at room temp. Lactoflavin accelerates the bleaching. Solutions of the carotenoid in org. solvents fade more rapidly, yielding colourless decomp. products which, unlike retinene, give a negative Carr-Price test for vitamin-A. When rapidly heated to 60—70° green solutions change to orange-red. The absorption spectrum of the red form shows increased extinction at 4800 Å. and an almost complete disappearance of the (I) band at 6400 Å. The green colour reappears on rapid cooling, provided that heating is not prolonged or the temp. allowed to reach 80°, when an orange-pink protein coagulum is formed.

L. S. T.

**Sedimentation constant of ovoverdin.** R. W. G. WYCKOFF (Science, 1937, 86, 311—312).—Ovoverdin

solutions prepared from lobster eggs by the method described above (cf. preceding abstract) contain a homogeneous protein with a sedimentation const. at 20° of  $10.3 \times 10^{-13}$  cm. per sec. per dyne.

L. S. T.

**Visual adaptation and chemistry of the rods.** G. WALD and A. CLARK (J. Gen. Physiol., 1937, 21, 93—105).—Measurements of dark and light adaptation in varying circumstances conform with predictions from a chemical cycle proposed to describe the rhodopsin system.

E. M. W.

**Absorption bands of oxycytochrome-C.** E. YAKUSHIJI (Acta Phytochim., 1937, 10, 125—128).—The prep. of cytochrome-C (I) (from heart muscle of ox) and its absorption bands in various media are described. The absorption spectrum of (I) in  $\text{H}_2\text{O}$  gives bands at 700 and 625 m $\mu$ . The former closely resembles that of oxycytochrome-C (II) in 10%  $\text{NaOH}$  at 670—680 m $\mu$ , the difference being ascribed to difference of  $p_{\text{H}}$ , whilst the latter is a typical methemoglobin band. Examination of these and bands obtained in various acid and alkaline solutions indicates that the absorption spectra of (II) is a haematin spectrum complicated by the basic character of (I).

P. W. C.

**Dialysis of milk. III. Salt equilibrium with special reference to calcium, magnesium, and phosphorus.** L. H. LAMPITT, J. H. BUSHILL, and D. F. FILMER (Biochem. J., 1937, 31, 1861—1873; cf. A., 1934, 1125).—The normally unstable salt equilibrium of milk is stabilised in the prep. of milk powder, so that shaking does not alter the amounts of dialysable Mg, Ca, or P. The reactions produced by acidification of raw separated milk with lactic acid (I) are not reversible, and the results of dialysis of milks of differing acidity cannot be compared even after neutralisation to the same  $p_{\text{H}}$ . The concn. of dialysable Ca and inorg. P  $\propto$  the titratable acidity of milk powder solution to which (I) has been added. Dialysable org. P is unaffected.

P. G. M.

**Variations in calcium and phosphorus contents of cow's milk during the lactation period.** T. M. OLSON (S. Dakota Agric. Exp. Sta. Ann. Rept., 1934, 30—31).—The Ca and P contents of milk are high at the beginning of lactation. The Ca content falls to a min. at 6—8 weeks and remains substantially const. throughout until drying-off, when vals. rise to 20—30% > normal. The P content falls rapidly at first (6 weeks) and then more slowly until the end of the period.

CH. ABS. (p)

**Total sulphur in human and cow's milk.** L. REVOL and R. PACCARD (Compt. rend. Soc. Biol., 1937, 126, 25—26).—The vals. for human and cow's milk are 82—202 and 270—440 mg. per litre, respectively. The variation in the S is > that in the N content.

H. G. R.

**Iodine and bromine [in milk].** J. S. MCHARGUE (Kentucky Agric. Exp. Sta. Ann. Rept. [1933], 1934, 44—45).—The normal I content of milk in Kentucky is 30 parts per billion. I-feeding increases this 13-fold.

CH. ABS. (p)

**Analysis of proteins. IX. Content in amino-acids of the caseinogen and lactalbumin of**

woman's milk. R. H. A. PLIMMER and J. LOWNDES (Biochem. J., 1937, **31**, 1751—1757).—Analytical data are given for woman's and cow's milk and the nutritive vals. of the two milks are compared.

W. O. K.

Composition of milk from stock rats : apparatus for milking small laboratory animals. W. M. COX, jun., and A. J. MUELLER (J. Nutrition, 1937, **13**, 249—261).—Rat milk contains 2—3 times the total solid content of human or cow milk and by comparison with these is low in carbohydrate and high in protein and fat.

A. G. P.

Lipin analysis of human thoracic duct lymph. R. REISER (J. Biol. Chem., 1937, **120**, 625—634).—A method for the determination of the lipin distribution in lymph is described and the following vals. are obtained for the thoracic duct lymph of a patient on low-fat diet : phospholipin (I) 70—87, total cholesterol (II) 23—31, free (II) 5—12, neutral fat (III) 300—344 mg. per 100 g.; I val. of (I) 84—95, that of (III) 69—74. The mean *M* of the fatty acids in (I) and (III) as indicated by the ratio of their reducing power to  $K_2Cr_2O_7$  to their titration val. to alkali, is close to that of stearic and oleic acids.

A. L.

Storage of bull sperm for artificial impregnation. B. HATZIOLOS (Z. Züchtung, 1937, **B**, **38**, 199—254).—Best conditions for keeping the sperm are examined. The f.p. of semen was 0.62°, the Cl content 0.6—0.9%, and the  $p_H$  6.39—7.81. At 13—19° the sperm remained alive in spermiatic fluid 69 hr., in isotonic saline 71.76, in Ringer's and Tyrode solutions, respectively, 68.88 and 48.72 hr., but much longer at lower temp. At temp. <0°, sperms soon die. Of 20 cows, impregnated with sperms kept alive at low temp., only two became pregnant.

P. W. C.

Reducing power and sulphur derivatives in exudates. K. APPRICH and F. F. URBAN (Biochem. Z., 1937, **292**, 360—367).—The reducing power of exudates from human patients was equiv. to 2.5—5.5 mg. of Prussian-blue per 100 c.c. The val. is reduced by an average of 27% by  $CH_3O$ , indicating a SH content of 0.12 mg. per 100 c.c. These vals. and those of total and inorg. S could not be correlated with the type of disease.

F. O. H.

Indian snake venoms. II. Cobra venom : its chemical constitution, protein fractions, and their physiological actions. S. N. GANGULY and M. T. MALKANA. III. Enzymes in cobra and daboia venom. IV. Mechanism of the coagulant action of daboia venom on blood. S. N. GANGULY (Indian J. Med. Res., 1936, **24**, 281—286, 287—294, 525—529).—II. The venom contains C, H, O, N, S, and P. The dried material contains 87.56% of protein (I), and also lecithin (II) and cholesterol; the (I) fractions are : globulin 20.31, albumin 39.69, primary proteose 11.31, and secondary proteose (III) 16.81%. (II) is present in combination with (I) as well as in the free state. The activity of the venom is due to (III), hydrolysis of which to  $NH_2$ -acids by tryptic digestion destroys the toxic effect.

III. Both cobra and daboia venoms contain proteolytic enzymes capable of digesting gelatin, crust. ovalbumin, casein, and fibrin, and a (II)-splitting

enzyme, which is more powerful in cobra venom. Antivenenene (IV) does not affect these enzymes. Cobra venom contains also a rennin-like enzyme, the action of which is neutralised by (IV).

IV. The venom cannot replace Ca, convert prothrombin into thrombin, or fibrinogen into fibrin. Its coagulant action is due to liberation of thrombokinase from blood-platelets by cytolysis.

R. N. C.

Migration of the toxic constituents of cobra (*Naja naja*) venom at various  $p_H$  in an electric field. B. N. GHOSH and S. S. DE (Indian J. Med. Res., 1937, **24**, 1175—1182).—Cobra-neurotoxin (I) and -haemolysin (II) pass through parchment and ultra-fine filters, but Cellophane is impermeable. (I) and (II) show no isoelectric points between  $p_H$  2.2 and 10.0, and are hence apparently moderately strong bases. Cataphoretic experiments using intercepting membranes permit the removal of >2/3 of the proteins associated with (I) and (II), and also the partial separation of (I) from (II).

R. N. C.

Amylolytic activity of extracts of the salivary glands of octopods. R. DE MARCO (Riv. Biol., 1937, **23**, 74—80).—Aq. extracts of the salivary glands of *Octopus macropus* and *O. vulgaris* hydrolyse starch with production of dextrins but not of glucose.

F. O. H.

Enzymic action in the digestive canal. I. Human and horse saliva. II. Saliva of animals. T. MATSUOKA (J. Agric. Chem. Soc. Japan, 1937, **13**, 865—871, 872—874).—I. Human saliva contains large amounts of amylase (I) the activity of which is 0.045 of that of commercial Kyokuhō diastase, and varies only slightly from day to day. Sex and period of year have very little effect on the activity. Horse saliva contains only small amounts of (I).

II. Cattle, sheep, pig, and goat saliva contain only very small amounts of (I), whilst saliva of dogs, cats, rats, and guinea-pigs contain relatively large amounts.

J. N. A.

Glyco-ursodeoxycholic acid from bear's bile.—See A., II, 500.

Gastric analysis in Indians : study of 100 cases. M. N. RAO (Indian J. Med. Res., 1937, **24**, 1145—1157).—Analytical figures are given for free HCl, total acid, and total Cl<sup>-</sup>; pepsin and blood-Cl<sup>-</sup> are also determined in some cases.

R. N. C.

Relation between the  $p_H$  of the contents of the intestinal tract and the deposition of calcium in bones of rats. B. BISBEY and S. COVER (Missouri Agric. Exp. Sta. Ann. Rept. [1933], Bull., 1934, No. 340, 59—60).—No relation was apparent between the  $p_H$  of the upper and lower intestinal tract and rachitic changes in the bones of rats. The antirachitic action of vitamin-D cannot be ascribed to its action in changing the  $p_H$  of intestinal contents.

CH. ABS. (p)

Intubation of the human small intestine. W. O. ABBOTT and T. G. MILLER (J. Amer. Med. Assoc., 1936, **106**, 16—18).—A method of collecting unaltered intestinal secretion and of studying intestinal absorption is described.

CH. ABS. (p)

Progress in clinical urology. C. MITCHELL (Clin. Med., Surg., 1936, **43**, 19—23).—A review.

Qual. tests, especially for residues of medicines in urine, are considered. CH. ABS. (p)

**Determination of organic acids in urine by Hehner's method.** P. FLEURY and CARON-CLAEYSEN (J. Pharm. Chim., 1937, [viii], 26, 241—255).—The procedure is described. J. D. L.

**Chemical identification of ascorbic acid in urine.** P. J. DRUMM, H. SCARBOROUGH, and C. P. STEWART (Biochem. J., 1937, 31, 1874—1878).—Dehydroascorbic acid was isolated as its 2:4-dinitrophenylhydrazone (20 mg.) from normal urine (12 l.). Another hydrazone was also isolated but not identified. P. G. M.

**Source of androgenic and oestrogenic substances of the urine.** A. S. PARKES (Lancet, 1937, 233, 902—903).—A discussion. L. S. T.

**Indophenol-(2:6-dichlorophenolindophenol)-reducing properties of urine.** R. N. CHOPRA and A. C. ROY (Indian J. Med. Res., 1936, 24, 239—248).—The indophenol (I)-reducing power of the urine of normal individuals depends considerably on their diet; it is not increased on a ketogenic diet. The (I) titre varies with the nature and concn. of the acids used for titration; with 1% AcOH it is < with  $\text{CCl}_3\cdot\text{CO}_2\text{H}$ . AcOH,  $\text{CCl}_3\cdot\text{CO}_2\text{H}$ , and  $\text{H}_2\text{SO}_4$  are not efficient preservatives for (I)-reducing substances in urine, but 5%  $\text{CCl}_3\cdot\text{CO}_2\text{H}$  is apparently better than the others. The (I)-reducing power of the urine of patients with epidemic dropsy and even of some normal subjects is low, although symptoms of scurvy are never present. The reducing power runs almost parallel with uric acid excretion. R. N. C.

**Duality of the coproporphyrins in bovine congenital porphyrinuria.** C. RIMINGTON and G. C. S. ROETS (Nature, 1937, 140, 584—585).—A photomicrograph of coproporphyrin III, isolated from a case of this disease, shows that, as with the related uroporphyrins, compounds belonging to both isomeric types, series I and series III, occur in certain pathological conditions. L. S. T.

**Franke's reaction.** A. E. RAICES and C. V. SUAREZ (Rev. med.-quir. patol. femenina, 1935, 6, 513—518).—Urine is shaken with aq. methylene-blue. In the presence of bilirubin a green colour is produced. Urobilin may interfere. CH. ABS. (p)

**Excretion of vitamin-C in sweat.** R. E. BERNSTEIN (Nature, 1937, 140, 684—685).—Vitamin-C excreted in the sweat of Bantu labourers working at 96—97° F. in the Witwatersrand Au mines amounts to 0.5—1.1 mg. per 100 c.c. or approx. 2 mg. per hr. Urinary excretion of -C remains unchanged. L. S. T.

**Symptomatology and pathology of potassium and magnesium deficiencies in rats.** G. A. SCHRADER, C. O. PRICKETT, and W. D. SALMON (J. Nutrition, 1937, 14, 85—109). A. G. P.

**Injurious effects of sodium chloride and their prevention.** E. KEINING and G. HOPE (Arch. Dermatol. Syphilol., 1935, 32, 739—745).—Daily administration of 20 g. of NaCl to allergic patients caused shock. Irritation is caused by Na<sup>+</sup> rather than by Cl<sup>-</sup>. KCl, CaCl<sub>2</sub>, MgCl<sub>2</sub>, and SrCl<sub>2</sub> caused no

irritation. Mixtures of these salts and NaCl in proportions occurring in sea-H<sub>2</sub>O and in blood-serum were non-irritating and therapeutic. CH. ABS. (p)

**Anæmia and agranulocytosis during sulphanilamide therapy.** G. H. JENNINGS and G. SOUTHWELL-SANDER (Lancet, 1937, 233, 898—901).—Blood counts show that  $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$  (I) is a potential marrow poison. Erythropoiesis and leucopoiesis may be depressed by (I). L. S. T.

**Biochemistry of the anæmias. IV. Mineral constituents of the blood and phenylhydrazine anæmia. V. Carbohydrates and hæmorrhagic and phenylhydrazine anæmias.** G. STOLFI and A. LALLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 288, 289; cf. A., 1937, III, 378).—IV. The [Cl<sup>-</sup>] of whole blood (rabbit) increases, mainly in the plasma, the serum-Na, -K, and -Ca also being increased.

V. The anæmia, especially that due to hæmorrhage, is followed by hyperglycæmia and diminution of liver-glycogen. The effect on glycolysis is irregular, the tendency being for the disappearance of glucose in a given vol. of blood to decrease and that per erythrocyte to increase. F. O. H.

**Nitrogen metabolism of abscesses in anæmic and non-anæmic dogs. Reserve stores of protein apparently involved.** F. S. DAFT, F. S. ROBSCHT-ROBBINS, and G. H. WHIPPLE (J. Biol. Chem., 1937, 121, 45—59).—Normal non-anæmic dogs in which sterile abscesses were produced by subcutaneous injection of turpentine show fever, leucocytosis, and an increase in urinary N above the level of the fasting dog. With dogs which have been anæmic for years, similar fever and leucocytosis are produced but no increase in urinary N. A dog which had been anæmic for a few weeks showed an intermediate reaction. The labile protein stores which may contribute to the building of hæmoglobin or plasma-protein are probably factors related to protein catabolism and excess urinary N observed. Creatine vals. suggest that a part of these labile protein stores is present in the muscles and it is highly probable that the liver is concerned. P. W. C.

**Hæmoglobin regeneration in anæmic rats in relation to iron intake: bioassay technique for measuring available iron.** M. C. SMITH and L. OTIS (J. Nutrition, 1937, 13, 573—582).—Modifications of Elvehjem's method for determining available Fe in foodstuffs are described. Data thus obtained for numerous foodstuffs are recorded. A. G. P.

**Influence of iron from red clay on pig development.** F. V. GAAZ and M. G. LUBNIKOVA (Probl. Animal Husbandry U.S.S.R., 1935, No. 3, 43—54).—Red clay of high Fe content prevents anæmia in pigs having no access to pasture, and is more efficient in this respect than proprietary Fe preps. CH. ABS. (p)

**Sulphur (colloidal) therapy in treatment of arthritis.** S. C. WOLDENBERG (Med. Bull. Veterans Admin., 1935, 12, 10—26).—Arthritic patients are deficient in S (finger-nail tests). Injection of colloidal S increased the cystine vals. CH. ABS. (p)

**Lactoflavin in the treatment of canine black-tongue.** W. H. SEBRELL, D. J. HUNT, and R. H. ONSTOTT (U.S. Publ. Health Repts., 1937, 52, 235—239).—Five experimental dogs died in 1—30 days after having received a total dosage of 8—38 mg. of riboflavin. Riboflavin has no therapeutic val. in acute black-tongue and is distinct from the preventive factor. W. L. D.

**Mechanism of pathological calcification.** W. E. BURGE, O. S. ORTH, H. W. NEILD, J. ASH, and R. KROUSE (Arch. Path., 1935, 20, 690—696).—A demarcation current in injured frog muscle (2—4  $\mu$ a.) was observed, and was  $>$  that in injured branches of greenhouse plants.  $\text{PO}_4'''$  was also present in injured muscle. Treatment of injured areas with  $\text{CaCl}_2$  or  $\text{BaCl}_2$  eliminated the demarcation current [probably by pptn. of  $(\text{CaBa})_3(\text{PO}_4)_2$ ]; dil.  $\text{H}_3\text{PO}_4$  or  $\text{NaH}_2\text{PO}_4$  restored it. The electronegative character of injured or contracted muscle is attributed to the presence of  $\text{PO}_4'''$  probably produced by hydrolysis of creatinine phosphate or adenylyl pyrophosphate. Ca salts may be concerned in the production of cortical cataract and K salts in that of nuclear cataract. CH. ABS. (p)

**Calcinosis universalis.** E. G. RAMSDELL (West J. Surg. Obstet. Gynecol., 1935, 43, 624—635).—Ca deposits in the subcutaneous tissues began to be absorbed almost immediately after unilateral thyroidectomy and attempted parathyroidectomy. CH. ABS. (p)

**Photosensitivity of chick embryo cells growing in media containing certain carcinogenic substances.** M. R. LEWIS (Amer. J. Cancer, 1935, 25, 305—309).—Chick-embryo cells in media containing carcinogenic hydrocarbons develop photosensitivity to electric light. Methylcholanthrene, 1:2:5:6-dibenzanthracene, and 1:2-benzpyrene (0.05—0.1%) do not interfere with mitosis or growth of the cultures until exposed to bright light. After 2—10 min. changes occur in cells and mitosis is inhibited, although the cells subsequently recover and proliferate. No recovery follows prolonged exposure. CH. ABS. (p)

**Effect of prolonged cyanide treatment on body and tumour growth.** I. H. PERRY (Amer. J. Cancer, 1935, 25, 592—598).—Prolonged inhalation of HCN retarded body growth and inhibited growth of Jensen sarcoma in rats. CH. ABS. (p)

**Intermediate glycolysis of tumour cells.** A. CALÓ (Acta Cancrologica, 1935, 1, 437—457).—During glycolysis of tumour tissue in a glucose substrate  $\text{PO}_4'''$  disappears more slowly than during the glycolysis of muscle, and the rate of dissociation of esterified  $\text{PO}_4'''$  is also less. Neoplastic tissue hydrolyses hexose diphosphate, glycerophosphate, phosphoglyceric acid, and glyceraldehydophosphoric acid without production of lactic acid (I).  $\text{AcCHO}$  is converted into (I),  $\text{MeCHO}$  being the intermediate product. CH. ABS. (p)

**Disturbance of lipin metabolism in patients with malignant tumour.** II. R. INDOVINA and S. FIANDACA (Acta Cancrologica, 1935, 1, 605—616).—Unsaturated lipins extracted from dried serum by  $\text{Et}_2\text{O}$  represent weakly bound or available forms.

Total unsaturated lipins are determined by boiling dried serum with  $\text{Et}_2\text{O}$ — $\text{EtOH}$  (1:3). The ratio of the two vals. ("availability quotient") is 6 normally and in cases of liver and kidney diseases, and 2 in cancer. CH. ABS. (p)

**Sensitisation of the skin of mice to light by carcinogenic agents.** I. DONIACH and J. C. MOTTRAM (Nature, 1937, 140, 588).—White mice painted with benzpyrene (I) in  $\text{C}_6\text{H}_6$  become sensitised to light. Only blue-violet light, corresponding with the absorption spectrum of (I), is effective. Tar and dibenzanthracene produce similar reactions. L. S. T.

**Pulmonary tumours in mice.** I. Susceptibility of lungs of albino mice to the carcinogenic action of 1:2:5:6-dibenzanthracene. H. B. ANDERVONT (U.S. Publ. Health Repts., 1937, 52, 212—221).—Mice of special strain were given subcutaneous injections of dibenzanthracene (0.8 mg.) in lard (0.2 ml.). Most of the animals developed lung tumours in a shorter time than subcutaneous tumours. W. L. D.

**Derivatives of 1:2-benzpyrene.**—See A., II, 491.

**Reaction of tarred rabbits to the infectious fibroma virus (Shope).** C. H. ANDREWES, C. G. AHLSTROM, L. FOULDS, and W. E. GYE (Lancet, 1937, 233, 893—895).—Rabbits injected with tar and then with fibroma virus show a generalised fibromatosis not found in rabbits without tar, and the regression of intracutaneous fibromata is delayed. Benzpyrene affects the response of rabbits to intravenous or intradermal inoculations of fibroma virus in a manner similar to tar. L. S. T.

**Fractionation of guinea-pig's liposarcoma.** P. MENDELEEFF (Compt. rend. Soc. Biol., 1937, 126, 80—82).—The fraction obtained after treatment of the tumour juice with colloidal  $\text{Al}(\text{OH})_3$  and filtration with a Berkefeld filter D3 contains the sp. principle antigenic to rabbits and producing antibodies which arrest the growth of the cancerous tissues *in vivo* in guinea-pigs. H. G. R.

**Effect of liposarcoma (Murrey) and organ extracts on germination and growth of wheat.** L. HAVAS and P. MENDELEEFF (Compt. rend. Soc. Biol., 1937, 126, 83—85).—Extracts of sarcoma stimulate germination and slightly stimulate growth, whereas extracts of the organs of rabbits immunised against the sarcoma have no effect on germination and inhibit growth. H. G. R.

**Occurrence of vitamin- $B_2$  in rat sarcoma: vitamin- $B_2$  content of liver tissue.** L. B. BRABCO (Amer. J. Cancer, 1935, 25, 551—584).—Rat sarcoma tissue contained small quantities of vitamin- $B_2$ . The amounts in the liver tissue of tumour-bearing rats was seven times that of sarcoma tissue but  $<$  that of normal liver tissue.  $-B_2$ -deficient diets do not prevent the irritation or growth of rat sarcoma 39. No evidence was obtained that tumour growth consumes  $-B_2$ . CH. ABS. (p)

**Susceptibility to dental caries in the rat.** V. Influence of calcium, phosphorus, vitamin-D, and maize oil. T. ROSEBURY and M. KARSHAN

(Arch. Path., 1935, 20, 697—707; cf. A., 1935, 383).—With a rice-dextrin-spinach diet, supplements producing a high-level of Ca were more effective than those giving a low-Ca level in producing caries in rats. In both cases grinding the rice to pass a 100-mesh sieve prevented the occurrence of caries. Addition of cod-liver oil or viosterol in maize oil diminished but did not completely prevent caries even when supplemented with Ca and P to give the normal ratio at normal or high levels. Ultra-violet irradiation sufficient to produce improvement in calcification equal to that given by 5% of cod-liver oil was less effective in preventing caries than was vitamin-D. Maize oil significantly diminished the incidence of caries. Differences in incidence of caries among rats receiving diets with approx. adequate calcifying properties were unrelated to blood-Ca or -P. The protective action of calcifying diets was not paralleled by the extent of their calcifying action. CH. ABS. (p)

**Minimal threshold of dental fluorosis.** H. T. DEAN (U.S. Publ. Health Repts., 1937, 52, 1249—1264).—The degree of fluorosis is gauged from an approx. mottled enamel index, and vals. for different Southern United States cities are tabulated. The index  $\propto$  mean annual F content of the H<sub>2</sub>O supply, which ranged from 0.7 to 2.2 p.p.m. Amounts <1 p.p.m. are of no public health significance. W. L. D.

**Acid in blood as a source of diseases of the skin.** J. E. GINSBERG (Arch. Dermatol. Syphilol., 1935, 32, 464—465).—In cases of common dermatoses, there was no acidosis or alkalosis. CH. ABS. (p)

**Effect of succinic acid on diabetic ketosis.** D. M. DUNLOR and W. M. ARNOTT (Lancet, 1937, 233, 738—740).—Three case reports indicate that succinic acid has no effect in preventing the onset of diabetic coma or in diminishing chronic diabetic ketonuria. L. S. T.

**Pancreatic and pituitary diabetes in vagotomised dogs.** A. O. ETCHVERRY (Compt. rend. Soc. Biol., 1937, 126, 159—160).—Pituitary or pancreatic diabetes is not affected by vagotomy. H. G. R.

**Glycæmic curve after intramuscular injection of insulin in diabetics.** A. FERANNINI (Minerva med., 1935, II, 674—677).—Data for 10 cases are recorded. CH. ABS. (p)

**Eczema.** I. Specificity of the eczematous skin reaction. G. MIESCHER. II. Role of alkali in the pathogenesis of industrial eczemas. III. Role of alkali damage of the skin in experimental sensitisation to nickel. W. BURCKHARDT. IV. Action of bacterial toxins on the skin. P. ROBERT (Arch. Dermatol. Syphilis, 1935, 173, 119—154).—I. Skin reactions to panthesin, Ca(OH)<sub>2</sub>, *d*- $\alpha$ -pinene, mustard oil, croton oil, HCl, cantharidin anhydride, and broth filtrates of bacteria and fungi are examined.

II. Patients exposed to alkaline liquors show increased toxic hypersensitivity to alkalis, the power of the epidermal cells to neutralise alkalis being retarded.

III. Patients from Ni-plating works show toxic hypersensitivity to alkali. A single application of NiSO<sub>4</sub> produces Ni-sensitisation in some alkali-sensitive persons. CH. ABS. (p)

**Blood-iodine in relation to thyroid disease.** Basic concept of the relation of iodine to the thyroid gland: an iodine-tolerance test. H. J. PERKIN, F. H. LAHEY, and R. CATTELL (New England J. Med., 1936, 214, 45—52).—Blood-I vals. in adenomatous goitre, in primary hyperthyroidism, and during curative treatment are recorded. In I-tolerance tests, blood-I is determined 0.5, 1.0, 1.5, and 2.5 hr. after administration of I in milk. CH. ABS. (p)

**Blood-p<sub>H</sub> and -lactic acid in different types of heart disease.** I. HARRIS, E. W. JONES, and C. N. ALDRED (Quart. J. Med., 1935, 4, 407—415).—Under resting conditions blood-lactic acid (I) increases in heart failure, although -p<sub>H</sub> is normal except in extreme cases. Amounts of (I) produced by exercise increase with the extent of heart failure. CH. ABS. (p)

**Oestrogenic substances in treatment of pelvic inflammatory disease.** C. F. FLUHMAN and P. E. HOFFMANN (West. J. Surg. Obstet. Gynecol., 1935, 43, 678—680).—Successful use of amniotin is recorded. CH. ABS. (p)

**Physiology of the impaired liver.** J. L. BOLLMAN and F. C. MANN (Ergebn. Physiol., 1936, 38, 445—492).—Extensive injury to the liver or removal of large parts (up to 80%) of it frequently has but little effect on functions such as excretion of bile, regulation of blood-sugar, urea production, and deamination of NH<sub>2</sub>-acids but after complete removal production of glucose, bile salts (I), and allantoin ceases and NH<sub>3</sub>, uric acid, or (I) if administered is not altered or destroyed. W. McC.

**Mastitis. Effect on milk and tests for its detection.** K. G. WECKEL (Nat. Butter and Cheese J., 1937, 28, No. 12, 10—17).—Subclinical mastitis affects the yield and the properties of milk in the manufacture of products, especially cheese since curd strength is decreased and renneting time is increased. The importance of frequent testing of the four quarters of the udder by > one test is stressed. Changes in milk due to mastitis are tabulated and field tests are described. The most reliable are the bromthymol-blue and the catalase tests. W. L. D.

**Urinary proteins: appearance of kidney protein in urine of cases of chronic glomerular nephritis.** G. GILMAN (J. Urol., 1935, 34, 727—731).—In preuræmic stages of nephritis urine may contain an antigenic substance probably derived from the kidneys. Fractionation [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>] of a protein from urine of a patient in the last stages of chronic nephritis is described. Antisera obtained by injection of the two fractions were treated with the min. amounts of human serum-protein required to absorb the sp. precipitins. Resulting sera gave positive reactions with the original antigens and with a protein derived from a kidney autolysate. Proteins from other organs gave negative reactions. CH. ABS. (p)

**Elimination of phosphate and renal phosphatase activity following unilateral nephrectomy.** P. GILBERTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 358—361).—Unilateral nephrectomy in rabbits is followed by diminution in urinary inorg. P lasting 4—5 days; during and after this period, the phosphatase activity of the renal parenchyma is practically unchanged. F. O. H.

**Ratio dehydroascorbic : ascorbic acid [in urine].** B. BRUNO and M. GIUSEPPE (Boll. Soc. ital. Biol. sperim., 1937, 12, 307—309).—In normal men, the ratio is 0.08—0.70 (average 0.338), the corresponding vals. for patients with renal-gastric-hepatic or Addison's disease being 0.63—3.80 (1.806) and 7.00—8.50 (7.70), respectively. F. O. H.

**Sugar tolerance in obese subjects. Review of 65 cases.** R. F. OGILVIE (Quart. J. Med., 1935, 4, 345—348).—Sugar tolerance diminishes with duration of obesity and with advancing age. There is hypertrophy of the islets of Langerhans. Lack of ovarian secretion may decrease sugar tolerance. CH. ABS. (p)

**Effect of surgical operation on (A) urinary excretion of sulphur.** G. AGOSTA. **(B) Blood-glutathione.** G. AGOSTA and L. BLOTTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 282—283, 283—284).—(A) Acid S is significantly, and total S slightly, diminished whilst ethereal and neutral S are increased. The increase in neutral S  $\propto$  the degree of operative trauma.

(B) The erythrocyte count may either increase or diminish, the blood-glutathione following a parallel course. F. O. H.

**Wool of sheep with osteomalacia.** R. SALGUES (Compt. rend., 1937, 205, 580—582).—The yield of wool from merinos with osteomalacia is 56.4% < normal. The H<sub>2</sub>O and fatty acid content and the Ca : P ratio are increased, whilst the ash and protein contents are decreased. J. L. D.

**Blood-sugar and glycaemic curve during Parkinson's disease.** G. OGGIONI (Boll. Soc. ital. Biol. sperim., 1937, 12, 330—333).—The described characteristics of the blood-sugar curve due to ingestion of 1 g. of sucrose per kg. body-wt. are modified by effective curative treatment. F. O. H.

**Role of manganese and certain other trace elements in the prevention of perosis.** H. S. WILGUS, jun., L. C. NORRIS, and G. F. HEUSER (J. Nutrition, 1937, 14, 155—167).—Mn (and to a smaller extent Zn and Al) prevents perosis in chicks. A mixture of Mn, Al, and Fe is entirely preventive in presence of limited amounts of Ca and P. A. G. P.

**Fitness, sulphanilamide, and pneumococcus infection in the rabbit.** A. LOCKE, R. B. LOCKE, R. J. BRAGDON, and R. R. MELLON (Science, 1937, 86, 228—229).—Data showing the effectiveness of sulphanilamide in experimental pneumococcus infection as determined by the condition of the rabbit and the capacity for resistance are recorded. L. S. T.

**Permeability of blood-central nervous system barrier in experimental poliomyelitis as deter-**

**mined by the nitrate test.** E. H. LENNETTE and H. R. REAMES (Proc. Soc. Exp. Biol. Med., 1937, 36, 769—770).—A slight increase in the barrier to NO<sub>3</sub>' occurs in experimental poliomyelitis.

H. G. R.

**Permeability of the blood-central nervous system barrier to sodium bromide in experimental poliomyelitis.** E. H. LENNETTE and D. H. CAMPBELL (Science, 1937, 86, 160).—The data recorded show that NaBr passes into the spinal fluid more readily in poliomyelitic than in normal monkeys. An increase in blood-central nervous system barrier is thus indicated in experimental poliomyelitis. L. S. T.

**Lipin metabolism and psoriasis. Determination of individual lipin fractions in fasting and fat-charged serum of psoriatic and non-psoriatic persons.** F. SCHAAF and M. OBTULOWICZ (Arch. Dermatol. Syphilis, 1935, 173, 253—261).—No differences were found in the total fatty acid, phosphatide-P, or cholesterol (free or esterified) contents of sera from psoriatic and non-psoriatic patients with or without liver impairment. Variations in lipin fractions after eating were considerable among healthy individuals. CH. ABS. (p)

**Clinical spectroscopy. Retention of nickel in psoriasis.** L. E. GAUL and A. H. STAUD (Arch. Dermatol. Syphilol., 1934, 30, 697—703).—The Ni content of psoriatic was > that of normal persons. Literature on sources of Ni in food is reviewed.

CH. ABS. (p)

**Coal tar and allied substances.** M. E. OBERMAYER and S. W. BECKER (Arch. Dermatol. Syphilol., 1935, 31, 796—810).—Effects of applying coal tar fractions and a no. of phenols to psoriatics are recorded. Pyrocatechol and 8-hydroxyquinoline were the most effective but were inferior to the crude tar. Neither sulphonated bituminous tars nor petroleum tars showed therapeutic effects resembling those of coal tar. CH. ABS. (p)

**Nutritive state in metabolism of women during pregnancy.** F. C. HUMMEL, H. A. HUNSCHER, M. F. BATES, P. BONNER, I. G. MACY, and J. A. JOHNSTON (J. Nutrition, 1937, 13, 263—278).—The daily storage of N, P, Cl, S, Ca, Mg, Na, and K during the last 65 days of gestation is recorded. The dietary requirements for pregnancy, especially N and Ca, are notably influenced by the previous nutritional history. A. G. P.

**Chemical diagnosis of pregnancy by detection of oestrin in urine.** M. J. SCHMULOVITZ and H. B. WYLLIE (J. Lab. Clin. Med., 1935, 21, 210—216).—Oestrin is determined by extraction with Et<sub>2</sub>O under appropriate conditions and coupling with diazotised p-NO<sub>2</sub>-C<sub>6</sub>H<sub>4</sub>-NH<sub>2</sub>. CH. ABS. (p)

**Histamine ionisation therapy.** D. POTTER (J. State Med., 1935, 43, 729—737).—Histamine ionisation produces a greater local effect in a short time without material skin injury than any ion used with an electric current. Effects are described. CH. ABS. (p)

**Rickets in sheep.** E. S. SIMPSON (Elder's Weekly, 1937, 764).—The livers of lambs suffering

from enzootic ataxia (Gingin disease) contain only about 0.001% of Cu (determined spectroscopically) as compared with 0.03% to 0.05% in normal animals. The deficiency of Cu in the pasture is the cause of the disease, which may be eliminated by the use of Cu-containing licks and dressings. W. O. K.

**Rickets-producing action of cereals.** M. DE BRUIN and J. BOUMAN (Z. Vitaminforsch., 1937, 6, 295—309).—The greater rachitogenic activity in rats of oats than that of rice is not due to differences in org. P content nor to the Mg or low NaCl content of the oats. The activity of oats or rice is not affected by NaCl or Et<sub>2</sub>O- or EtOH-extracts of the cereals but addition of EtOH-extract of barley reduces the activity of oats. The active principle of oats is present in aq. extracts, pptn. of which by EtOH yields an inactive ppt. and a filtrate containing material which promotes production of rickets when added to a rice diet. F. O. H.

**Factors determining rickets in rats fed on cereal diets.** J. C. MOTTRAM and N. PALMER (Cereal Chem., 1937, 14, 682—686).—Rats fed on a purely cereal diet, as such or with excess of Ca salts, or on oatmeal in which all the P had been rendered digestible, developed rickets. Addition of Ca in amount equiv. to twice the P present prevented rickets. Potato starch, gluten flour, and caseinogen behaved similarly to the cereals. Hence the rachitogenic action of cereals is due not to a sp. factor but to an excess of P over Ca. E. A. F.

**Effect of acid-base content of diet on the production and cure of rickets with special reference to citrates.** A. T. SHOHL (J. Nutrition, 1937, 14, 69—83).—For each Ca/P ratio in the diet there is a zone of low abs. amounts which produces rickets. Addition of NH<sub>4</sub>Cl-(NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> to non-rachitogenic diets renders them rachitogenic; addition to rachitogenic diets increases the severity of their action. NH<sub>4</sub>Cl is the more active constituent. Addition of citric acid-Na citrate to rachitogenic diets, with all Ca/P ratios examined, eliminates the property of inducing rickets. The acid reaction and the alkali ash factors are both essential for this effect. Among org. acids examined only citric and tartaric acids were active in this respect. A. G. P.

**Brain metabolism during the hypoglycæmic treatment of schizophrenia.** H. E. HIMWICH, K. M. BOWMAN, J. WORTIS, and J. F. FAZEKAS (Science, 1937, 86, 271—272).—O<sub>2</sub> utilisation by the brain, and hence its metabolic rate, is decreased during severe hypoglycæmia. Insulin, by decreasing blood-sugar, starves the brain, finally leading to hypoglycæmic coma. L. S. T.

**Fall of vitamin-C content during acute experimental scurvy in the guinea-pig.** E. NEŠPOR (Arch. Internat. Physiol., 1937, 45, 128—134).—On a diet lacking vitamin-C, all organs show a more or less rapid depletion of -C during the first 14 days, after which symptoms become obvious. Subsequently depletion continues more slowly. The actual rates of depletion are characteristic for each organ. Spleen loses -C most rapidly  $\propto$  its initial content, and is the earliest to become quite exhausted. The testis and

brain still contain -C at the 28th day, which is the limit of survival. R. M. M. O.

**Photometric determination of urea, uric acid, creatinine, and hæmoglobin in blood of scorbutic guinea-pigs.** S. P. VILTNER and R. JOHNSTIN (J. Nutrition, 1937, 13, 329—338).—Experimental technique is described. The decreased uric acid (I) in urine of scorbutic guinea-pigs is probably not related to increased blood-(I). In scorbutic animals hæmoglobin diminished but the subsequent anæmia was never severe. A. G. P.

**Ten cases of idiopathic steatorrhœa.** T. E. H. THAYSEN (Quart. J. Med., 1935, 4, 359—395).—In cases described derangement of metabolism was characterised by increased fæcal fat, slightly increased N excretion, a flat blood-sugar curve, and increased basal metabolism. Fæcal fermentation frequently observed depended on fæcal acidity and was not due to starch. Carbohydrate digestion was normal. CH. ABS. (p)

**Resorption conditions for bismuth: value in oral therapy for syphilis.** S. SEREFIS (Arch. Dermatol. Syphilis, 1934, 171, 1—98; cf. A., 1935, 657).—Curative effects of BiCl<sub>3</sub> on dogs are recorded; in alkaline solutions it was tolerated in large doses. Urinary elimination persisted 7 weeks after cessation of treatment. Glycerol (I) and citrates facilitated resorption by preventing pptn. of BiOCl in the stomach. Solutions of BiCl<sub>3</sub> in (I)-citrate are stable in dil. acids and alkalis but proteins ppt. Bi in 4 hr. Bi in urine may be determined by Barrenscheen and Frey's method, or if >0.02 mg. per 100 c.c. is present, by the colorimetric KI method, using a H<sub>2</sub>SO<sub>4</sub> solution of the ash. CH. ABS. (p)

**Mapharsen ("arsenoxide") in the therapy of experimental syphilis and trypanosomiasis.** O. M. GRUHZIT, W. D. LINDSAY, G. HENDRICKS, and M. C. DODD (Arch. Dermatol. Syphilol., 1935, 32, 848—867).—The therapeutic, sterilising, and curative indices of Mapharsen (*m*-amino-*p*-hydroxyphenyl-arsine oxide) compared favourably with that of arsphenamine and neoarsphenamine for rats and rabbits. CH. ABS. (p)

**Immunochemistry of tuberculosis.** S. OSATO (Proc. Imp. Acad. Tokyo, 1937, 13, 223—228).—Aq. NaCl extracts of excessively infected tissue have a favourable influence when injected into patients and experimental animals. The active component occurs in the COME<sub>2</sub>-sol. neutral fat and also in the lecithin-kephalin fraction of the EtOH-Et<sub>2</sub>O extract of human tuberculous lung. R. M. M. O.

**Chemical detection of traces of metal in bullet wounds.** A. BRUNING and M. SCHNETKA (Chem.-Ztg., 1937, 61, 827—830).—Material stained with powder smoke is treated with HNO<sub>3</sub> to dissolve metallic particles. The solution is tested for Pb by means of dithizone (I); for Cu by means of rubeanic acid (II) or Ritter's test for the catalytic action of Cu on the formation of a blue colour by the oxidation of *p*-NMe<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·NH<sub>2</sub> +  $\alpha$ -C<sub>10</sub>H<sub>7</sub>·OH with H<sub>2</sub>O<sub>2</sub>; for Ni by spot tests (on paper) with (II) or dimethylglyoxime. Zn is tested for by means of (I); the interference due to the Cu, Pb, and Ni present is suppressed by adding

5% aq.  $\text{Na}_2\text{S}$ . 0.001 mg. of Zn then gives a red coloration in the presence of 0.1 mg. of Cu, Pb, or Ni. Sn salts alone interfere, but are eliminated by evaporating the solution with  $\text{HNO}_3$ . Smoke stains and contusion rings arising from shots with bare Pb bullets show much Pb, usually detectable by contact reaction without any need for dissolution in  $\text{HNO}_3$ .  $\text{HNO}_3$  extracts from smoke stains from older small arms ammunition show traces of Pb, much Cu and Zn, and small amounts of Ni from Ni-plated cartridges. Modern (rust-free) cartridges give smoke stains with high Pb content. Blood does not interfere with the reaction for Pb.

J. S. A.

**Xanthoma. Biochemistry and pathogenesis.** G. G. VILLELA and R. JUNIOR (Mem. Inst. Oswaldo Cruz, 1935, 30, 285—304).—Xanthoma without (but not with) renal injury caused cholesterolemia. In both cases the fatty acids and lipins of blood and tissues were increased. Insulin decreased cholesterolemia in the first but not in the second case.

CH. ABS. (p)

**Life, a photochemical steady state.** H. F. BLUM (Science, 1937, 86, 285).—A discussion.

L. S. T.

**Physiology of muscle.** O. RIESSER (Ergebn. Physiol., 1936, 38, 133—250).—A review. W. McC.

**Physiology and biochemistry of the reproductive organs.** H. B. VAN DYKE (Ergebn. Physiol., 1936, 38, 836—854).—An account is given of the  $\text{H}_2\text{O}$ , glycogen, phospholipin, free and esterified cholesterol, neutral fat, mineral, vitamin-C, enzyme, protein and other N contents of the reproductive organs of mammals (and of a few other species), of the physiological changes which occur in these (and in some other) contents, of the metabolism of the isolated uterus, isolated testis, and isolated seminal vesicle, and, in the case of some of the organs, of the effect of injection of sex hormones. Changes in the  $v_H$  of the vaginal fluid are also discussed.

W. McC.

**Basal metabolism of rats in relation to old age and exercise during old age.** F. G. BENEDICT and H. C. SHERMAN [with H. L. CAMPBELL and A. ZMACHINSKY] (J. Nutrition, 1937, 14, 179—198).—The total basal metabolism per 24 hr. in old is > in middle age. Towards old age vals. approach a const. level of approx. 100 g.-cal. per kg. The actual basic heat output and the body-wt. decreased slightly with advancing age. Enforced vigorous exercise of middle-aged male rats not previously exercised caused loss of wt. and finally, death. Female rats so treated benefited from the exercise and showed diminished basal metabolism.

A. G. P.

**Energy metabolism of the hen.** H. H. DUKES (J. Nutrition, 1937, 14, 341—354).—In prolonged fasting the metabolic rate diminished for 75 hr. and then remained uniform. The R.Q. reached a steady level after 24 hr. Basal metabolism was lower in older hens. Basal heat loss due to vaporisation of  $\text{H}_2\text{O}$  averaged 17% of the total heat loss. Basal insensible loss and basal metabolism were positively correlated. Basal metabolism increased somewhat during egg production.

A. G. P.

**Heat production of small organisms.** I. R. TAYLOR and F. CRESCITELLI (J. Cell. Comp. Physiol., 1937, 10, 92—112).—The method described is based on the measurement of the heat, generated electrically, which must be added to one calorimeter in order to balance the heat produced by the organism in another differentially arranged calorimeter. The apparatus is largely automatic. The average error was  $\pm 3\%$ . Results obtained on pupae of various insects are given.

M. A. B.

**Measurement of heat production from insensible loss of weight.** L. H. NEWBURGH, M. W. JOHNSTON, F. H. LASHMET, and J. M. SHELDON (J. Nutrition, 1937, 13, 203—221).—Calculation of heat production from the insensible loss of wt. (method described), the dietary carbohydrate, and urinary N yields vals. differing by <5% from those obtained by indirect calorimetry when several 24-hr. periods are averaged.

A. G. P.

**Derivation of factors for computing the gaseous exchange and heat production in the metabolism of proteins.** M. KRISS and L. R. VORIS (J. Nutrition, 1937, 14, 215—221).—Data are obtained from observations of N, C, and energy balances of rats receiving a basal diet followed by one supplemented with heart muscle, casein, or gelatin.

A. G. P.

**Effect of galactose on human respiratory quotient and alveolar carbon dioxide.** T. M. CARPENTER (J. Nutrition, 1937, 13, 583—600).—Ingestion of galactose (I) markedly diminished alveolar  $\text{CO}_2$  and simultaneously increased the R.Q. With (I)-glucose mixtures the two effects were less closely synchronised. With lactose (II) the max. R.Q. was obtained considerably before the max. effect on alveolar  $\text{CO}_2$ , the lag being attributed to time required for hydrolysis of (II). The formation of acid products in the intermediate metabolism of (I) is indicated. Amounts of reducing substances (sugars) eliminated in urine following ingestion of various proportions of different sugars were in the ascending order, control, 50 g. of (II), 25 g. each of (I) and glucose, 25 g. of (I), 50 g. of (I).

A. G. P.

**Respiratory quotient following ingestion of glucose and of fructose as affected by the lactic acid and carbon dioxide changes in the blood.** G. BACHMANN and J. HALDI [with W. WYNN and C. ENSOR] (J. Nutrition, 1937, 13, 157—178).—Ingestion of 50 g. of glucose (I) produced in general no increase of blood-lactic acid (II) or decrease in  $-\text{CO}_2$ ; ingestion of 50 g. of fructose (III) increased (II) and decreased  $-\text{CO}_2$  within 15 min. The effect of 25 g. of (I) + 25 g. of (III) was similar. The metabolic R.Q. following feeding of (III) was > after (I). This is ascribed to conversion of (III) into fat.

A. G. P.

**Effect of exercise on metabolism following ingestion of water, glucose, and fructose as shown by the course of the respiratory quotient.** J. HALDI and G. BACHMANN [with W. WYNN and J. M. LITTLE] (J. Nutrition, 1937, 14, 287—304).—The increase in R.Q. during exercise was substantially the same when the sugar as when  $\text{H}_2\text{O}$  was ingested immediately before. Glucose (I) and fructose (II) produce the same results. Increased metabolism

caused by exercise persisted some few min. afterwards. In the sugar tests the R.Q. increased during the first recovery period above the level reached in exercise, mixtures of sugars producing the greatest and (I) the least effect.

Part of the glucose was probably converted into fat and exercise accelerated the conversion. Exercise accelerated the metabolism of (I) but not that of (II).

A. G. P.

**Relative oxygen consumption of dorsal and ventral regions of intact amphibian gastrulae: observations on unfertilised eggs.** J. BRACHET and H. SHAPIRO (J. Cell. Comp. Physiol., 1937, 10, 133—146).—O<sub>2</sub> consumption is 47% greater in the dorsal than in the ventral region of the embryo. No consistent difference was observed between the animal and vegetal poles of the unfertilised egg.

M. A. B.

**Relative respiratory activity of sheath and axones in resting *Limulus* optic nerve.** H. SHAPIRO (J. Cell. Comp. Physiol., 1937, 9, 381—396).—Respiration in the axones is in the sheath and varies in different portions of the axones, being highest in the middle. These relations are unaltered by variations of temp.

M. A. B.

**Respiration of the newt. I. The method and data on the normal and gonadectomised animal.** C. M. POMERAT and M. X. ZARROW (J. Cell. Comp. Physiol., 1937, 9, 397—415).—Respiratory rate was not affected by castration, but the R.Q. increased from 0.70 to 0.83.

M. A. B.

**Gaseous metabolism of working skeletal muscle.** H. BRUNER and F. GROSSE-BROCKHOFF (Pflüger's Archiv, 1936, 238, 361—373).

M. A. B.

**Respiration and gaseous metabolism in the initial stages of physical work.** F. GROSSE-BROCKHOFF, W. SCHOEDEL, and W. SPRINGORUM (Pflüger's Archiv, 1936, 238, 374—378).

M. A. B.

**Determination of respiratory quotient in marine animals.** M. W. BOSWORTH, H. O'BRIEN, and W. R. AMBERSON (J. Cell. Comp. Physiol., 1936, 9, 77—87).—Average R.Q. vals. are 0.89—1.05, indicating a mixed metabolism with that of carbohydrate preponderating. Similar vals. are given by air-breathing forms in a similar physiological condition; the metabolic processes are probably the same. Respiratory CO<sub>2</sub> reacts with the carbonates of crustacean chitin, producing extra HCO<sub>3</sub>' and giving a false R.Q. The shells must therefore be covered with paraffin or collodion.

M. A. B.

**Oxygen consumption of tissues as a function of hydrogen-ion concentration of the media.** C. TARANTINO (Riv. Biol., 1937, 23, 281—290).—Skin, kidney, and muscle tissue of rats in Ringer's solution have max. O<sub>2</sub> consumption at  $p_H$  6.1, 6.7, and 6.7 respectively. The val. for skin is different ( $p_H$  6.4—7.0) when the tissue is regenerating. Cancerous tissue of mice shows no max. val. with change of  $p_H$ .

F. O. H.

**Oxidative properties of isolated amphibian germinal vesicles.** J. BRACHET (Science, 1937, 86, 225).—Tests on germinal vesicles isolated from

*Rana fusca* indicate that the nuclear sap and the nucleoli reduce methylene-blue (I). Leuco-(I) is oxidised by the nucleoli. Respiration experiments indicate that the nucleus is not a centre of high metabolism in the growing oocyte.

L. S. T.

**Limnological investigations on respiration, annual migratory cycle, and related phenomena in fresh-water pulmonate snails.** E. P. CHEATUM (Trans. Amer. Microscop. Soc., 1934, 53, 348—370).—The effects of [O<sub>2</sub>] in H<sub>2</sub>O and of temp. on breathing rates and on O<sub>2</sub> consumption are examined.

CH. ABS. (p)

**Determination of basal- and exercise-cardiac output in dogs.** W. V. COX, J. W. HAWKINS, and H. F. ROBERTSON (J. Lab. Clin. Med., 1935, 21, 192—206).—A mask designed for measuring the O<sub>2</sub> intake is described.

CH. ABS. (p)

**Cyclic consumption of oxygen during the first divisions of the eggs of frogs and toads.** A. STEFANELLI (Riv. Biol., 1937, 23, 33—49).—The O<sub>2</sub> consumption, which is const. just before and after fecundation, cyclicly increases at the stages of blastulation and gastrulation to an extent dependent on the maturity of the egg at the time of fertilisation. The O<sub>2</sub> consumption of eggs of various species of *Bufo viridis* varies with their size.

F. O. H.

**Effect of pyocyanine on the metabolism of cerebral cortex.** L. YOUNG (J. Biol. Chem., 1937, 120, 659—675).—The effect of pyocyanine (I) ( $2 \times 10^{-3}$  to  $4 \times 10^{-5}M$ ) on the metabolism of rabbit's cerebral cortex is studied. (I) accelerates respiration with glucose, fructose, lactate, or pyruvate substrates in O<sub>2</sub>, this being followed by an irreversible inhibition of the respiration probably due to the  $\alpha$ -OH on the phenazine nucleus in (I). In absence of substrate, no acceleration occurs. 0.001M-KCN has an inhibitory action. In concn.  $>2 \times 10^{-4}M$ , (I) increases aerobic glycolysis; at all concns. tested, anaerobic glycolysis is initially increased.

A. L.

**Respiration chamber for use with human subjects.** L. H. NEWBURGH, M. W. JOHNSON, F. H. WILEY, J. M. SHELDON, and W. A. MURRILL (J. Nutrition, 1937, 13, 193—201).—The equipment and its operation are described.

A. G. P.

**Metabolism chamber which automatically maintains a constant partial pressure of oxygen.** H. F. PIERCE (J. Lab. Clin. Med., 1935, 21, 317—322).—Apparatus is described.

CH. ABS. (p)

**Specific dynamic action of food during rest and physical labour. I. Action of a carbohydrate breakfast.** N. S. SAVTSCHENKO (J. Physiol. U.S.S.R., 1935, 19, 1274—1280).—The max. sp. dynamic effect of carbohydrate breakfast occurs within 1 hr. of feeding, and in work is  $<$  in rest.

CH. ABS. (p)

**Specific dynamic action of proteins in fasting animals.** B. CERA and C. LOMBROSO (Boll. Soc. ital. Biol. sperim., 1937, 12, 312—313).—Following prolonged fasting in dogs, a protein-rich meal produces no or very little sp. dynamic action.

F. O. H.

**Specific dynamic action of perfused blood.** V. MARTINI (Boll. Soc. ital. Biol. sperim., 1937, 12,

313—314).—Perfusion of surviving animals with blood (fresh or preserved at 0°) does not increase the metabolism. In animals on a protein-rich diet there is generally no change in gaseous metabolism; in some cases, however, the O<sub>2</sub> consumption increases by amounts approx. corresponding with the sp. dynamic action of an equiv. amount of protein orally administered. F. O. H.

**Physiological bases of nutrition.** S. J. COWELL (Brit. Med. J., 1937, 406—409).—A lecture.

A. G. P.

**Nutrition and metabolism of insects.** C. H. RICHARDSON (Iowa Agric. Exp. Sta. Rept. Agric. Res., 1934, 96).—The housefly distinguished between H<sub>2</sub>O and sucrose (I) solution by touching the surface with the tarsi. Effects of various concns. of (I) are compared. At all concns. examined the response to fructose was < that to (I). CH. ABS. (p)

**Onychophora. II. Feeding, digestion, excretion, and food storage of *Peripatopsis*.** S. M. MANTON [with N. G. HEATLEY] (Phil. Trans., 1937, B, 227, 411—464).—The structure of the organs concerned with feeding and digestion of species of *Peripatopsis* is described. The digestive enzymes (see A., 1937, III, 220) are more suited to carnivorous than vegetarian habit. Fat, glycogen, and protein are stored in the intestinal wall and can maintain the animal during starvation for three months. Excretion occurs via the intestine, accumulatory organs, and nephridia. Urates are crystallised daily on the epithelial surface and are then collected and removed by the peritrophic membrane. The urine is acid and contains < 7% of NH<sub>3</sub> (dry wt.). Slime ejection is a purely defensive action and is not employed in feeding. P. W. C.

**Nutritional problems of domestic animals.** W. KLEIN (Z. Züchtung, 1937, B, 35, 379—399).—Data for the growth and metabolism of a wether fed for 7 months on straw-molasses (N 1.2—1.3%) and starch are tabulated. Production of wool and wool-oil was normal. Metabolic data (especially for N) and the correlated activity of micro-organisms in the rumen and faeces are discussed. F. O. H.

**Feeding of sheep.** F. J. WARTH and T. S. KRISHNAN (Indian J. Vet. Sci., 1935, 5, 216—231).—The digestibility of a hay-guinea grass-peanut cake ration varied with different animals and to some extent with their age. Wool yields varied with the nutritional condition of the animals. CH. ABS. (p)

**Influence of nutrition on the physiology of reproduction in sheep.** A. E. DARLOW and L. E. HAWKINS (Oklahoma Agric. Exp. Sta. Rept. [1932—4], 1934, 100—106).—The breeding behaviour of ewes, previously well fed, was not affected by the nature of the ration during the breeding season. Occurrence of oestrus and success of mating of poorly nourished ewes were improved by feeding highly nutritional rations during the season. CH. ABS. (p)

**Maintenance metabolism of growing pigs.** K. BREIREM (Bied. Zentr. [Tierernähr.], 1936, A, 8, 463—498).—A relationship is established between maintenance metabolism and live wt. in pigs. For pigs weighing 40—50 kg. determinations of maintenance

metabolism require a preliminary fasting period of 8—10 days. A. G. P.

**Maize sugar similar in [nutrient] value to cane sugar.** H. H. MITCHELL and J. R. BEADLES (Illinois Agric. Exp. Sta. 47th Ann. Rept. [1933—4], 1935, 78—80).—In digestion trials and carcass analyses with rats, no consistent differences in the val. of the two sugars were apparent. CH. ABS. (p)

**Physiological importance in nutrition of methods of preparation of foodstuffs. III. Content of histone bases in unroasted plant products.** B. BLEYER, W. DIEMAIR, and F. FISCHLER [with F. ARNOLD and H. BICKEL] (Biochem. Z., 1937, 292, 301—311; cf. A., 1936, 1415).—Chemical and biological examination of aq. extracts of coffee, cereal products, etc. confirm the presence of preformed histone bases. Analytical data for the content in various fractions (e.g., that pptd. by MeOH) are tabulated. F. O. H.

**Nuts fail as adequate substitutes for meat.** H. H. MITCHELL and J. R. BEADLES (Illinois Agric. Exp. Sta., 47th Ann. Rept. [1933—4], 1935, 80—82).—Beef-protein had a biological val. of 75, walnuts 56, raw peanuts 58, roasted peanuts 56, and pecan 75%. Analyses and results of (rat) feeding trials are recorded. CH. ABS. (p)

**Reproduction in rats receiving milk diets.** H. J. CHANNON and K. M. DORAN (Z. Vitaminforsch., 1937, 6, 309—316).—Rats fed on raw milk and biscuit of white flour containing (added) Cu, Mn, and Fe showed good growth and fertility through three generations. The results are contrasted with those of other workers using similar experimental methods. F. O. H.

**Nutritional properties of meat.** A. G. HOGAN and W. S. RITCHIE (Missouri Agric. Exp. Sta. Ann. Rept. [1933], Bull., 1934, No. 340, 27—28).—Six generations of rats grown on muscle meat or liver showed no ill effects. Wheat-germ oil as a source of vitamin-E did not improve the growth or reproduction of rats by comparison with controls. CH. ABS. (p)

(A) **Individual variations in susceptibility to dietary deficiency.** A. L. BLOOMFIELD. (B) **Latent deficiency in rats. Variations in weight loss on repeated feeding of defective diet.** L. R. FRENCH and A. L. BLOOMFIELD (J. Nutrition, 1937, 14, 111—116, 117—129).—(A) Considerable differences are shown in the response of rats of the same age and breed.

(B) Rats which have lost wt. on a deficient diet and subsequently regained on an adequate diet show a more rapid loss of wt. when subsequently fed the deficient diet. The nature of this phenomenon is discussed. A. G. P.

**Recovery in rats on refeeding after prolonged suppression of growth by dietary deficiency of protein.** C. M. JACKSON (Amer. J. Anat., 1936, 58, 179—194).—Female rats receiving a normal diet after 15 weeks of substantially protein-free feeding gradually regained normal size. Male rats similarly treated were small when mature. The reproductive capacity of the adult rats was normal. CH. ABS. (p)

**Protein supplements in poultry rations. VI. Influence of mungo in rations for chicks.** C. N. ADAN (Philippine Agric. J., 1935, 24, 562—573).—Rations supplemented with shrimp meal produced more vigorous chicks than did those supplemented with mungo meal. The latter failed to promote normal sexual development and was inefficient in producing feathers. CH. ABS. (p)

**Food intake of young rats held at nearly constant body-weight by restriction of dietary protein.** C. M. JACKSON (J. Nutrition, 1937, 13, 669—678).—Rats were maintained at const. body-wt. by feeding restricted amounts of protein (yeast-wheat germ) in conjunction with an otherwise adequate basal diet. After the initial period the daily consumption of protein diminished steadily for 6 weeks and subsequently remained const. The voluntary intake of the basal diet closely paralleled that of protein. The calorific val. of the whole diet consumed was slightly > that of the maintenance level. The maintenance protein requirement for male rats was somewhat < that of females. A. G. P.

**Protein minima for nitrogen equilibrium with different proteins.** D. MELNICK and G. R. COWGILL (J. Nutrition, 1937, 13, 401—424).—The min. amounts of lactalbumin, serum-protein, caseinogen, and gliadin essential to dogs for attaining N equilibrium were equiv. to 6.9, 8.6, 9.4, and 21.1% of the total ingested calories, respectively. The relative biological vals. were 100, 80, 73, and 33. A. G. P.

**Comparison of heated casein with extracted casein in the basal diet for determination of vitamin-A.** E. N. TODHUNTER (J. Nutrition, 1935, 13, 469—476).—No appreciable difference was observed between the effects of EtOH-extracted and heat-treated casein when used as a protein source in a basal ration, on the growth, rate of depletion, or survival period of rats. A. G. P.

**Toxicity of high-gliadin diets on the dog and rat.** D. MELNICK and G. R. COWGILL (J. Nutrition, 1937, 14, 401—418).—Convulsive reactions of dogs were produced by diets in which gliadin (I) constituted < 16% of the caloric intake. Delayed responses suggest the gradual accumulation and subsequent elimination of a toxic substance during feeding of (I). Increases in blood-non-protein-N were insufficient to account for convulsions. (I) toxicity may be due to a protein sensitisation, and is a species characteristic. Rats fed diets containing 18 and 36% of (I) were stunted to approx. the same extent. Supplementary feeding of lysine induced a greater response in those receiving the 36% (I) diet. A. G. P.

**Effect of quality of protein on oestrous cycle.** P. B. PEARSON, E. B. HART, and G. BOHSTEDT (J. Nutrition, 1937, 14, 329—339).—Rats receiving a diet containing 5% of casein as principal protein source soon cease to exhibit the customary oestrous changes. Supplementary feeding of gelatin [high lysine (I)] induced partial oestrous response, but gliadin [low (I)] caused immediate resumption of normal sexual rhythm. Feeding protein-deficient diets does not cause permanent sterility. A. G. P.

**Effect of diet on the constancy of urinary nitrogenous constituents excreted daily by pre-school children.** J. E. HAWKS, M. M. BRAY, and M. DYE (J. Nutrition, 1937, 13, 179—192).—Total urinary N, urea, creatinine, and (in one case) uric acid excreted by children receiving const. medium-protein diets varied to approx. the same degree as, and creatine to a greater extent than, the corresponding dietary vals. Transition to a high-protein diet increased the variability of total N, urea, NH<sub>2</sub>, and creatine vals. for approx. 9 days, after which an equilibrium condition was reached. Acidity, uric acid, NH<sub>2</sub>-acids, and creatinine contents showed no change in variability. Individual children tended to react similarly to alterations of dietary protein. A. G. P.

**Growth on histidine and lysine administered by subcutaneous or intraperitoneal injection.** R. M. CONRAD and C. P. BERG (J. Nutrition, 1937, 14, 35—43).—Injected histidine and lysine are effectively utilised by rats and effect growth increases comparable with those obtained by feeding the NH<sub>2</sub>-acids. A. G. P.

**Glycine contents of proteins of normal and chondrodystrophic chick embryos at different stages of development.** A. R. PATTON (J. Nutrition, 1937, 13, 123—126).—Glycine (I) is synthesised during the development of chick embryos. Death due to chondrodystrophy during development is associated with < normal (I) contents of the proteins. A. G. P.

**Nutritive value of commercial peptones.** M. M. CASTILLA (Bol. farm. militar., 1935, 13, No. 147, 65—67).—Determinations of nutrient vals. of peptones yield erroneous results if the material is adulterated with dextrin, which is pptd. with peptone in the Denayer test. A method of separating the dextrin is described. CH. ABS. (p)

**Biological synthesis of proteins.** T. BAUMGARTEL (Chem.-Ztg., 1937, 61, 885—886).—A brief review.

**Excretion products of nitrogenous metabolism and their origin. I. End-products of the degradation of various amino-acids.** G. MOURROT (Bull. Soc. Chim. biol., 1937, 19, 1209—1294).—A detailed account of work previously published (A., 1937, III, 259). P. W. C.

**Muscular work and nitrogenous metabolism.** M. D. MEZINGESCO (Arch. Internat. Physiol., 1937, 45, 84—115).—An increase in the sp. endogenous N metabolism is obtained with muscular work, the ratio of the supplementary excretion of N to the energy liberated being similar to that of the endogenous excretion to the energy liberated at rest. This is due to an increased excretion of urea, a slight increase in uric acid, but little change in the creatinine val. H. G. R.

**Digestion and absorption in the crab *Paratelphusa* (*Oziotelphusa*) *hydromus*, Herbst.** A. R. REDDY (Proc. Indian Acad. Sci., 1937, 6, B, 170—193).—Amylolytic, proteolytic, and lipolytic enzymes are present in the digestive secretion. The first has an optimum temp. of 45° and acts best in neutral solution. It hydrolyses starch, glycogen, and

sucrose. A cytase is also present. The proteolytic enzyme has optimum action in 0.05N- $\text{Na}_2\text{CO}_3$ , whilst the lipolytic enzyme hydrolyses many fats and esters. Fats, glycogen, and Ca salts are present as reserves in the cells of the digestive glands. J. N. A.

**Nutritive significance of the amino-acids and certain related compounds.** W. C. ROSE (Science, 1937, 86, 298—300).—A review. L. S. T.

**Lysine deficiency results in poor use of protein.** J. OUTHOUSE and R. KROUSE (Illinois Agric. Exp. Sta. 47th Ann. Rept. [1933—34], 1935, 261—262).—Rats receiving a diet free from lysine (I) excrete more urea and creatinine and less allantoin than those receiving a similar diet containing (I). Lack of dietary (I) leads to increase in stature but not in growth, and probably to inefficient utilisation of protein and diminished cellular metabolism.

CH. ABS. (p)

**Cystine deficiency in the albino rat.** T. E. WEICHELBAUM (Quart. J. Exp. Physiol., 1935, 25, 363—367).—A large proportion of rats kept on a diet free from cystine (I) died. Feeding (I) or methionine (II) prevented this. After the appearance of deficiency symptoms (I) but not (II) showed curative action.

CH. ABS. (p)

**Synthesis of *p*-bromophenylmercapturic acid in the fasting rabbit.** W. J. CONWAY (J. Biol. Chem., 1937, 121, 27—29).—Fasting rabbits, like cats and dogs (cf. A., 1936, 1406), are able to synthesise *p*-bromophenylmercapturic acid (I) from PhBr even after a fast of 32 days, the cysteine required being of endogenous origin. An improved method of isolating (I) is described. P. W. C.

**Synthesis of phospholipins during absorption of fats.** C. ARTOM and G. SARZANA (Arch. Internat. Physiol., 1937, 45, 32—39).—Lipin-P of the liver, intestines, and kidney was shown to be radioactive 9 hr. after administration of olive oil together with  $\text{PO}_4^{3-}$  containing a radioactive isotope of P (Fermi *et al.*, A., 1934, 1284); no change was observed in the muscle-, heart-, spleen-, or blood-lipins.

H. G. R.

**Phospholipin synthesis during fat absorption.** C. ARTOM, C. PERRIER, M. SANTANGELO, G. SARZANA, and E. SEGRE (Boll. Soc. ital. Biol. sperim., 1937, 12, 275—277; cf. A., 1937, III, 345). F. O. H.

**Turnover of phospholipins in the intestinal mucosa.** R. G. SINCLAIR and C. SMITH (J. Biol. Chem., 1937, 121, 361—372; cf. A., 1936, 1283).—In cats the change from a higher to a lower level of unsaturation of the phospholipins (I) of the mucosa following replacement of cod-liver oil by tallow in the diet occurs almost as readily as the reverse change which follows replacement of saturated by unsaturated fat in the diet. Administration of elaidic acid (II) results in replacement of 30—50% of the fatty acids of (I) by (II). The ratio of solid to liquid fatty acids in (I) is 36:65 but (II) replaces equal proportions of the solid and liquid acids. The % of solid acids in (I) is not decreased appreciably following absorption of large amounts of oleic or linoleic acid. Possibly in the enzymic synthesis of (I) selective absorption of saturated and unsaturated acids in the

ratio 1:1 occurs, (II) being considered as both a saturated and an unsaturated acid. W. McC.

**Effect of low-fat diets on serum-lipins of rats.** A. E. HANSEN and W. R. BROWN (J. Nutrition, 1937, 13, 351—357).—In rats receiving a fat-free diet serum-lipins (I) show a degree of unsaturation < normal. The I val. of (I) in young is < in old animals. Restriction of the intake of a normal diet to produce the same level of live-wt. as did the fat-free diet induced a degree of unsaturation of (I) which was > in normal animals receiving an unrestricted diet. Administration of Me linoleate sufficient to effect a clinical cure of the unsaturated fatty acid-deficiency disease caused a slight increase in the I val. of (I). Esters of oleic acid under similar conditions considerably increased the I val. of (I) even though effecting only a partial clinical cure. A. G. P.

**Effect of choline on the lipin metabolism of blood and liver in the completely depancreatized dog maintained with insulin.** A. KAPLAN and I. L. CHAIKOFF (J. Biol. Chem., 1937, 120, 647—657; cf. A., 1937, III, 345).—Choline (I) (0.25 g. per kg. per day) fed to depancreatized dogs maintained with insulin prevented the deposition of liver-fat, but the curative action of (I) on fatty livers once established was slow. The action of (I) is therefore similar to that of pancreas, but whether the latter is active only by reason of its (I) content is not known. (I) administration did not raise the blood-lipins above normal; the pancreatic blood-lipin factor therefore cannot be (I). A. L.

**Dietary prevention of fatty livers. Two analogues of choline.** H. J. CHANNON, A. P. PLATT, and J. A. B. SMITH (Biochem. J., 1937, 31, 1736—1742).—Homocholine exerts a similar but more pronounced effect in controlling the % of fat in the livers of rats fed on diets which promote the development of "fat" or "cholesterol" fatty livers.  $\text{OH}[\text{CH}_2]_2\text{NPr}_3\cdot\text{OH}$  has no effect on the development of fatty livers. P. G. M.

**Nature of the lipotropic agent in pancreas.** F. X. AYLWARD and L. E. HOLT, jun. (J. Biol. Chem., 1937, 121, 61—69).—A comparison of the lipotropic effect of choline and of pancreas (ox) in controlling the fatty liver produced by high-fat diets in rats indicates that the effect of the pancreas is adequately explained by its choline content. P. W. C.

(A) Reducing substances and (B) lipin degradation in sterile autolysates of the liver of depancreatized dogs treated with choline. G. GALLO and C. ARDY (Boll. Soc. ital. Biol. sperim., 1937, 12, 315—316, 316—317).—(A) The autolysis is accompanied by an increase in the content of reducing substances (I).

(B) Variations occur in the fat content of the liver during autolysis. These are not related to the changes in (I). F. O. H.

**Intestinal absorption of triolein in absence of bile or pancreatic juice.** U. LOMBRISO, L. BELLINI, and S. FILIPPON (Boll. Soc. ital. Biol. sperim., 1937, 12, 311—312).—The rate of absorption of triolein in dogs with Vella fistulae (A., 1937, III, 384)

equals that of oleic acid, both rates being increased by presence of pancreatic juice. F. O. H.

**Flavin metabolism of newly-born children.** W. NEUWEILER (Z. Vitaminforsch., 1937, 6, 316—324).—The flavin content of human milk is  $16-52 \times 10^{-6}\%$ . Urinary excretion of lyochrome 9 days after birth is  $>$  that in adults and is increased by administration of lactoflavin (I). The effect of (I) intake on growth in a case of hypovitaminosis- $B_2$  is described.

F. O. H.

**Elimination of cinchonine and cinchonidine in the bile.** F. CAUJOLLE (Bull. Sci. Pharmacol., 1937, 39, 425—428).—Cinchonine and cinchonidine administered intravenously to dogs are eliminated in the bile, the max. rate of elimination occurring 6 hr. after injection.

W. O. K.

**Biliary elimination of quinidine.** F. CAUJOLLE (Bull. Sci. Pharmacol., 1937, 44, 376—379).—A small % of quinidine given intravenously to dogs is detected in the bile.

E. M. W.

**Degradation of diethylaniline and diethylaniline oxide in the animal body.** F. HORN (Z. physiol. Chem., 1937, 249, 82—84; cf. A., 1936, 1290).—In dogs and rabbits subcutaneously injected  $\text{NPhEt}_2$  (I) is converted into  $p\text{-OH}\cdot\text{C}_6\text{H}_4\cdot\text{NET}_2$  (II) but not into  $\text{NPhEt}_2\cdot\text{O}$  (III). No unchanged (I) is excreted in the urine. (III) is partly converted into (II) but chiefly excreted unchanged. (III) is very slightly toxic but (I) is more toxic than  $\text{NPhMe}_2$ . Methæmoglobin is observed in the blood of cats given lethal doses of (I) or (III).

W. McC.

**Metabolism of the higher hydroxy-acids.** C. ARTON, M. GAGLIANI, and E. VENTURA (Boll. Soc. ital. Biol. sperim., 1937, 12, 274—275).—The material, m.p.  $118^\circ$ , I val. 13.2, Ac val. 126.3, obtained by oxidation of oleic acid with alkaline  $\text{KMnO}_4$ , when administered to rats, is absorbed to the extent of 43—85% (i.e.  $<$  that of stearic acid). Only traces are subsequently found in the organs and fat depots but the OH content increases in tissues and body-fats. No storage occurs in the liver.

F. O. H.

**Nutritional and metabolic significance of certain organic acids.** A. H. SMITH and J. M. ORTEN (J. Nutrition, 1937, 13, 601—633).—A review.

A. G. P.

**Canned, home-cooked, and raw fruit diets.** E. F. KOHMAN, W. H. EDDY, M. E. WHITE, and N. H. SANBORN (J. Nutrition, 1937, 14, 9—19).—No inherent advantage attaches to "rawness." Cooking need not cause deterioration of nutrient vals. but improves the texture of foods and inactivates detrimental enzymes. Canned foods afford an efficient source of Ca.

A. G. P.

**Acetylation. II. Effect of various substances on the production of  $p$ -aminobenzoic acid in rabbits.** B. HARROW, A. MAZUR, E. BOREK, and C. P. SHERWIN (Biochem. Z., 1937, 293, 302—304; cf. A., 1933, 1194).—The acetylation of injected  $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{CO}_2\text{H}$  in rabbits is stimulated, in varying degrees, by injection of glucose, fructose, maltose, lactose, sucrose,  $\text{AcOH}$ , lactic acid, succinic acid, glycerol, oleic acid, glutamic acid, or glycine but not by that of  $\text{NaCl}$  or glutathione. Possibly carbo-

hydrates, fats, and proteins undergo intermediate acetylation in the body. W. McC.

**Conjugation of phenol in the eviscerated, nephrectomised dog.** G. BARAC (Compt. rend. Soc. Biol., 1937, 126, 62—64).—The conjugation is demonstrated.

H. G. R.

**Activation of glycolysis by carotene.** C. ASZKENAZY, K. STERN, and R. WILHEIM (Biochem. Z., 1937, 293, 30—38).—Aq. emulsions of lecithin (I) and cholesterol (II) do not materially affect the course of glycolysis of muscle extracts. The action of carotene (III) in increasing glycolysis is completely lost on adding (I) to the (III) emulsion whilst its action is maintained or even augmented when (II) is added. With mixtures of (I), (II), and (III), the effect is determined by the ratio of (I)/(II).

P. W. C.

**Glycolysis. I. Apomyozymase and the co-enzymes of glycolysis in muscle extract.** L. P. KENDAL and L. H. STICKLAND (Biochem. J., 1937, 31, 1758—1773).—Highly, but not moderately, diluted dialysed rabbit's muscle extracts are activated to a greater extent by boiled muscle extract than by adenosine triphosphate (I) and  $\text{Mg}^{++}$ . The glycolytic system contains a factor resembling, and possibly identical with, yeast cozymase, but there is also present a heat-stable factor apparently distinct from any of the known co-enzymes. By extraction of washed muscle pulp with  $\text{Na}_2\text{HPO}_4$ , the various components of the glycolytic system are partly separated, the order of extraction being (I) +  $\text{Mg}^{++}$ , hexose diphosphate (II), cozymase, the new co-enzyme, and finally apomyozymase, a term used to denote a prep. of the glycolytic system, active in the presence of boiled extract, but the co-enzyme requirement of which is not satisfied by (I) +  $\text{Mg}^{++}$ , (II), and cozymase.

W. O. K.

**Action of normal and diabetic sera on animal liver-glycogen *in vivo* and *in vitro*.** O. L. V. DE WESSELOW and W. J. GRIFFITHS (Lancet, 1937, 233, 670—673).—Injection of fasting human serum reduces the liver-glycogen (I) of rats. Normal and diabetic sera produce the same % reduction. Human serum accelerates glycogenolysis in rabbit's liver pulp *in vitro*. No such effect occurs in the rat. The effects of injection of serum on the liver (I) of the rat are probably not due to amylolytic enzymes in the serum.

L. S. T.

**Refecation in the rat.** E. KELLY and H. T. PARSONS (J. Nutrition, 1937, 13, 453—468).—Raw potato starch in rat diets causes refecation. Gelatinisation of the starch at temp.  $<$  that significantly affecting vitamin-B prevents refecation. Elimination of -B by rats receiving a high-starch diet was approx. thrice that occurring when the starch was gelatinised. The non-extractable fat of the starch is not a significant factor in refecation.

A. G. P.

**Influence of carbohydrate on nitrogen metabolism in the normal nutritional state.** P. S. LARSON and I. L. CHAIKOFF (J. Nutrition, 1937, 13, 287—304).—A protein-sparing effect of additional dietary carbohydrate occurs only when the latter is administered within 4 hr. before or after the meal, i.e., when an increase in protein metabolism is in

progress. The effect is most marked when the supplementary carbohydrate is given with or  $\geq 1$  hr. after the meal. The N thus spared begins to be eliminated several hours after its storage has occurred. Cessation of additional carbohydrate feeding is rapidly followed by increased N excretion. A. G. P.

**Relation of ingested carbohydrate to type and amount of blood- and urine-sugar and to the incidence of cataract in rats.** H. S. MITCHELL, O. A. MERRIAM, and G. M. COOK (J. Nutrition, 1937, 13, 501—511).—Blood-sugar vals. were higher on galactose- (I) than on lactose-containing rations but were  $>$  normal with all cataract-producing rations. When various sugars were supplied, resulting differences in total blood-sugar (II) were largely occasioned by differences in the non-fermentable fractions, the fermentable fractions remaining approx. const. and within the normal range of blood-glucose. In different strains of rats receiving a diet containing 35% of (I) the (II) vals. were similar but susceptibility to cataract differed considerably. Fructose-starch (III) rations caused neither hyperglycemia nor eye changes. A xylose-(III) ration slightly increased (II) and caused transitory changes in the lens. Insulin-protamine did not lower blood-galactose or diminish the rate of development of cataract. Galactosuria occurred in all animals receiving (I) and lactose rations, being more severe with (I), but was absent from starch-fed controls. (I) is the major etiological factor in cataract. A. G. P.

**Carbohydrate metabolism. II. Effect of a high-carbohydrate diet containing sugar on the glucose-tolerance curve in the albino rat.** G. SANKARAN and K. RAJAGOPAL (Indian J. Med. Res., 1936—37, 24, 1077—1081; cf. A., 1937, III, 291).—A high-carbohydrate diet containing sucrose does not affect the glucose-tolerance curve in rats, and the islets of Langerhans exhibit no degeneration. R. N. C.

**Digestion of carbohydrates in mulberry leaves by silkworms. III. Growth and products of silkworms fed on mulberry leaves to which sucrose is added in different proportions. IV. Digestion of chemical components of mulberry leaves and composition of silkworms fed on leaves with added sucrose.** K. KATO, S. MIWA, and S. NEGI (J. Agric. Chem. Soc. Japan, 1937, 13, 879—888, 889—897; cf. A., 1935, 523).—III. The body-wt. and health of silkworms, wt. of cocoon and raw silk, and sericin-N solubility of raw silk are increased by feeding on young leaves + 1 to 2% of sucrose (I). Excess of (I) causes a decrease. The ratio fibroin:sericin is increased by addition of (I). The denier of silk is only slightly affected but tends to decrease with older leaves + (I).

IV. The increase in digestion of dry matter  $\propto$  amount of (I). The digestion of raw protein, fat, and ash is increased by addition of small amounts of (I), whilst an excess causes a decrease. 90% of the added (I) is digested. The  $H_2O$  content of the silkworm body is inversely  $\propto$  (I), whilst the amount of fat and glycogen produced  $\propto$  (I). The amounts of raw protein and finally silk are increased by small amounts of (I). J. N. A.

**Physiological availability of heptoses.** J. H. ROE and C. S. HUDSON (J. Biol. Chem., 1937, 121, 37—43).—Whilst *d*-mannoheptulose (I) is utilised by rabbits (A., 1936, 370) but not by rats, the *aldo*-isomeride, *d*- $\alpha$ -mannoheptose (II), is not utilised by either rabbits or rats. Both (I) and (II) are markedly laxative to rats, probably due to the fact that the absorption coeffs. are extremely low (0.012 and 0.010, respectively). P. W. C.

**Comparison of glucose- and sucrose-tolerance tests.** E. G. SCHMIDT, J. S. EASTLAND, and J. H. BURNS (J. Lab. Clin. Med., 1935, 21, 13—25).—Sucrose (I)-tolerance tests indicated abnormal carbohydrate metabolism as well as did those with glucose (II). In normal metabolism the (I)-tolerance test yielded blood-sugar curves within normal limits established by (II); no sugar appeared in urine. The blood-sugar response in diabetes and arthritis is recorded. CH. ABS. (p)

**Superiority of lactose over other carbohydrates [in nutrition of rats].** J. OUTHOUSE and J. SMITH (Illinois Agric. Exp. Sta., 47th Ann. Rept. [1933—4], 1935, 249—250).—Lactose (I) possesses approx. 75% of the calcifying effect of cod-liver oil in rats. Partial substitution of (I) for starch (II) in a vitamin-D-free rachitogenic diet improves calcification. Absorption and retention of Ca and P are similar for (II) and (I). Faecal excretion of P from rats receiving (I) was  $<$  from those receiving sucrose or (II). Urinary P was highest on (I) diets and least on sucrose diets. CH. ABS. (p)

**Effect of (A) galactose, (B) glucose, and (C) fructose on the metabolism of alcohol in man.** T. M. CARPENTER and R. C. LEE (J. Pharm. Exp. Ther., 1937, 60, 254—263, 264—285, 286—295).—(A) The R.Q. and fat metabolism rise after the ingestion of galactose (I) alone but fall after that of (I) + EtOH. EtOH decreases (I) tolerance.

(B) The R.Q. rises after ingestion of glucose (II) and falls after that of EtOH; EtOH + (II) cause a fall followed after 2 hr. by a rise. There is a greater fall in fat metabolism after EtOH + (II) than after (II) alone.

(C) Fructose gives results similar to those of glucose. E. M. W.

**Glucose and hexose diphosphate breakdown in tumour tissue.** B. E. HOLMES (Biochem. J., 1937, 31, 1730—1735).—Crocker mouse-tumour tissue forms lactic acid from both glucose (I) and Na hexose diphosphate (II). The tissue loses its glycolytic power on (II) by keeping at 0°.  $AcCO_2H$  restores this but has no effect on (I)-glycolysis. *dl*-Glycer-aldehyde inhibits (I)- but not (II)-glycolysis. P. G. M.

**Intermediate metabolism of carbohydrates.** H. A. KREBS (Lancet, 1937, 233, 736—738).—Recent developments are summarised. L. S. T.

**Deuterium as indicator in the study of intermediary metabolism. XI. Biological uptake of deuterium by fatty acids and cholesterol.** D. RITTENBERG and R. SCHOENHEIMER (J. Biol. Chem., 1937, 121, 235—253; cf. A., 1937, III, 422).—Palmitic acid and cholesterol (I) contain no H which

undergoes slow replacement by D when treated with  $D_2O$  in presence of acid or alkali at  $\pm 100^\circ$ . When the  $D_2O$  content of the body-fluids of mice is maintained at 1.5% for  $\geq 98$  days by injection of  $D_2O$  the D content of their fatty acids increases to a const. val., which is greater in saturated than in unsaturated acids. The time required for the D content of the fatty acids to reach half its max. val. is 5–9 days, that for (I) in mice being 15–25 days. The D content of (I) reaches 50% of that of the body-fluids. The (I) of chicken embryos which develop in eggs containing  $D_2O$  contains no D; (I) is not degraded or synthesised during the development of the eggs. In mammals (I) is probably produced from a large no. of small mols. W. McC.

**Intermediary carbohydrate metabolism in embryonic life. VIII. Glyceraldehyde and glycolysis.** J. NEEDHAM and H. LEHMANN (Biochem. J., 1937, **31**, 1913–1925; cf. A., 1937, III, 346).—The inhibition of glycolysis by *dl*-glyceraldehyde (I) is due to the *l*-compound only; this does not reach 100% in the embryo owing to the formation of lactic acid (II) from (I) with glutathione as a co-enzyme. (I) is not an intermediate in glucose (III) breakdown and condensation to (III) does not occur in glyceraldehyde “fermentation.”  $AcCHO$  is formed non-enzymically by shaking (I) at  $37^\circ$  and is transformed into (II) by glyoxalase. H. G. R.

**Lactic acid in dogfish nerve.** W. S. ROOT (J. Cell. Comp. Physiol., 1936, **9**, 137–147).—In the excised nerve lactic acid increases, both in  $N_2$  and in  $O_2$ . In  $O_2$ - $CO_2$  mixtures the increase is smaller as the  $CO_2$  tension rises. In  $O_2$  or mixtures with low  $CO_2$  tension, acid-binding power is decreased. M. A. B.

**Chemical changes in smooth muscle. I. Chemistry of smooth muscle.** E. DWORACZEK and H. K. BARRENSCHEEN. **II. Glycolysis in smooth muscle of hens' stomach.** W. MEERAUS and G. LOEBER (Biochem. Z., 1937, **292**, 388–396, 397–402).—I. Dephosphorylation in stomach muscle of hens and pigeons is extremely rapid. Autolysis for short periods significantly increases the total acid-sol.  $PO_4$ . The contents of creatinephosphoric acid, creatinine, and creatine and the traumatic formation of  $NH_3$  are  $<$  those of striped muscle; the  $NH_3$  formed corresponds with the content of adenosinetriphosphoric acid (I), which in smooth muscle is readily decomposed to adenosinediphosphoric acid. (I) from striped muscle is identical with that from smooth muscle.

**II. The course of glycolysis [degradation of glycogen to lactic acid, formation of hexose diphosphate and, from phosphoglyceric acid,  $AcCO_2H$ , and activation of the process of  $AcCO_2H$  formation by adenylic acid and (I)] in smooth muscle is identical with that in striped muscle.** F. O. H.

**Intensity of succinate oxidation in surviving liver tissue.** O. ROSENTHAL (Biochem. J., 1937, **31**, 1710–1718).—The rate of oxidation of succinate (I) by slices of liver from different rats is nearly the same and is relatively const. for 2 hr. Its intensity is approx. tenfold that of other respiration processes. In contrast to the oxidation of lactate and pyruvate,

the oxidation of (I) is unaffected by starvation and is similar in this respect to the oxidation of glycerophosphate. P. G. M.

**Circulation of phosphorus in the body revealed by application of radioactive phosphorus as indicator.** L. A. HAHN, G. C. HEVESY, and E. C. LUNDGAARD (Biochem. J., 1937, **31**, 1705–1709).—Radioactive P (as phosphate) was injected subcutaneously in rabbits. Within 27 days 45% was excreted in the urine and 11.5% in the faeces. A P atom spends approx. 30 days in the body. The ratio active P : normal P is highest in the kidney, liver, and muscle, and lowest in the bones. P. G. M.

**Coupling of oxido-reductions and dismutations with esterification of phosphate in muscle.** D. M. NEEDHAM and R. K. PILLAI (Biochem. J., 1937, **31**, 1837–1851; cf. A., 1937, III, 346).—The synthesis of adenylyl pyrophosphate (I) is intimately connected with oxido-reduction processes, and the balanced reaction may be formulated: 2 triose phosphate + cozymase (II) + adenylic acid (III) +  $2H_3PO_4$  2 phosphoglyceric acid reduced (II) + (I). The absence of (II) or presence of  $CH_2I \cdot CO_2H$ , which prevents oxido-reduction, will also prevent synthesis of (I). There is no evidence of the transfer of P in muscle extract from hexose diphosphate (IV) to (I).  $AsO_4'''$ , which activates the breakdown of (IV), also prevents the synthesis of (I), although it has no effect on the oxido-reduction processes. P. G. M.

**Absorption of inorganic and organic phosphorus from the intestine.** M. LASKOWSKI (Biochem. Z., 1937, **292**, 319–325).—The rate of absorption of  $Na_2HPO_4$  in rats  $\propto$  its concn., that from the upper part of the intestine being  $>$  that from the lower.  $Na$  glycerophosphate is rapidly hydrolysed and the resulting inorg.  $PO_4'''$  readily absorbed. With  $Na$  phytin and diphosphoglycerate, slow hydrolysis results in a slow absorption rate of  $PO_4'''$ . The absorption of  $Na_2HPO_4$  is unaffected by administration of calciferol and accelerated by that of parathyroid hormone. F. O. H.

**Addition of acid sodium phosphate to table salt to correct phosphorus deficiency.** ANON. (U.S. Publ. Health Repts., 1937, **52**, 1157).—A human adult requires 0.88 g. of P out of recommended 1.32 g. daily for maintenance. The daily P intake from 20 g. of  $NaCl$  mixed with 4% of  $NaH_2PO_4$  would be 0.18 g. This would not be sufficient to correct P-deficiency. W. L. D.

**Effects of deficiency of phosphorus on utilisation of food energy and protein.** E. B. FORBES (J. Nutrition, 1937, **14**, 419–433).—Deficiency of dietary P sufficient to cause 15% decrease in body-P produced no effect on growth, or utilisation of protein or energy. With a diminution of 18% of body-P, protein digestibility decreased. A. G. P.

**Effect of phosphorus and calcium on growth and breeding qualities of beef cattle.** T. M. CLYBURN and E. D. KYZER (S. Carolina Agric. Exp. Sta. 47th Ann. Rept., 1934, 85–86).—Supplementary mineral feeding had no effect on the breeding quality of cattle. CH. ABS. (p)

**Immaturity of the organism as a factor determining the favourable influence of lactose on the utilisation of calcium and phosphorus.** R. B. FRENCH and G. R. COWGILL (J. Nutrition, 1937, **14**, 383—399).—Lactose (II) favours the utilisation of Ca and P in young but not in mature dogs. Experiments with rats indicate that (I) diminishes the excretion of Ca into the intestine. A. G. P.

**Calcium and phosphorus balances of Chinese college women.** L. C. KUNG and H. L. YEH (Chinese J. Physiol., 1937, **12**, 139—146).—Using a Chinese diet adjusted to meet Ca and P requirements calc. according to Western standards, with average Ca and P intakes of 0.419 and 0.972 g. per day, respectively, 11% of the Ca and 2.4% of the P were retained. J. N. A.

**Influence of parathyroid hormone, urea, sodium chloride, fat, and of intestinal activity on calcium balance.** J. C. AUB, D. M. TIBBETTS, and R. McLEAN (J. Nutrition, 1937, **13**, 635—655).—Intestinal absorption of Ca is not influenced by ingestion of urea or by over-secretion of the parathyroid. Ingestion of urea slightly increases blood-Ca in exophthalmic goitre and hyperparathyroidism and increases urinary excretion of Ca in all cases, independently of diuresis. In healthy conditions Ca excretion maintains a very steady level.

A. G. P.  
**Influence of specific mineral deficiencies on growth of body and organs of the rat.** E. S. EPPRIGHT and A. H. SMITH (J. Nutrition, 1937, **14**, 21—33).—When the intake of food-calories is approx. half normal, Ca and P are the most effective minerals in maintaining body-wt. increases, size of thymus, and general nutritive well-being. Although Na and K, separately or together, do not promote growth in the absence of other nutritive elements they are necessary to support max. possible development on a given energy and protein allowance. With rations free from Ca but containing Na and/or K the ratio of heart- and liver-wts. to body-wt. increased.

A. G. P.  
**Influence of some commonly used salt mixtures on growth and bone development in albino rats.** L. B. MENDEL, R. B. HUBBELL, and A. J. WAKEMAN (J. Nutrition, 1937, **14**, 261—272).—Of four mixtures examined that of Osborne and Mendel gave highest bone-ash vals. If adequate Ca is supplied other constituents of mixtures may be given in amounts considerably < those usually employed.

A. G. P.  
**New salt mixture for use in experimental diets.** R. B. HUBBELL, L. B. MENDEL, and A. J. WAKEMAN (J. Nutrition, 1937, **14**, 273—285).—The mixture contains a higher % of Ca than those customarily employed, but produced adequate calcification of rat femurs with an average daily intake of Ca 50 and P 35 mg.

A. G. P.  
**Variations in alkali reserve and its effect on liver function.** Z. GRUZEWSKA (J. Physiol. Path. Gen., 1935, **33**, 1093—1101).—In dogs with biliary fistulae increased alkali reserve caused by artificial stimulation of gastric secretion, intravenous injection of NaHCO<sub>3</sub> (I), or injection through a digestive tube

resulted in increased alkalinity of the bile. (I) was dispersed in the tissues and gradually released into the blood as elimination in the bile proceeded.

CH. ABS. (p)  
**Factors influencing mineral metabolism of dairy animals.** H. W. CAVE, W. H. RIDDELL, J. S. HUGHES, C. H. WHITNAH, and H. F. LIENHARDT (Kansas Agric. Exp. Sta. Rept. [1932—4], 1934, 71—77).—Calves reared for 1 year on milk alone showed no anæmic symptoms, but the digestive tract was underdeveloped. P deficiency did not depress the digestive functions nor induce abnormal energy losses, but caused a higher energy metabolism. Addition of salts (Ca, Mg, P) to unsweetened evaporated milk in the proportion of 1 : 100,000 improved the quality of the canned milk. CH. ABS. (p)

**Excretion of mineral substances after administration of various salts and its relationship to inhibition of "serous inflammation" by vegetable diets.** H. KAUNITZ (Biochem. Z., 1937, **293**, 142—156).—The influence of administration of various salt solutions (110 c.c. of 2% NaCl or 110 c.c. of an equimol. solution of KCl, NaHCO<sub>3</sub>, KHCO<sub>3</sub>, NaH<sub>2</sub>PO<sub>4</sub>, or KH<sub>2</sub>PO<sub>4</sub>) on the excretion during the subsequent 5 hr. of H<sub>2</sub>O, Na, K, Cl', and PO<sub>4</sub>" by dogs having bladder fistulae and fed on const. diet is investigated. After administration of NaCl, diuresis occurs but 85% of the H<sub>2</sub>O and 75% of the Na and Cl are still retained after 5 hr. Both K and PO<sub>4</sub> excretion are increased. After KCl, a K-, Na-, and Cl-diuresis occurs and the inorg. PO<sub>4</sub> excretion is increased to the same extent as with NaCl. After NaHCO<sub>3</sub>, elimination of H<sub>2</sub>O is even < that with NaCl and retention of Na occurs; K excretion is unaltered and inorg. PO<sub>4</sub> excretion increased. With KHCO<sub>3</sub>, diuresis is > that with KCl, the H<sub>2</sub>O, Na, and Cl excretion being increased and PO<sub>4</sub> excretion unchanged. With NaH<sub>2</sub>PO<sub>4</sub> only slight, but with KH<sub>2</sub>PO<sub>4</sub> considerable, H<sub>2</sub>O-, Na-, Cl-, and K-diuresis occurs. The action of vegetable diets on serous inflammation can be attributed only in part to the mineral content. P. W. C.

**Potassium and chloride in *Thyone* muscle.** H. B. STEINBACH (J. Cell. Comp. Physiol., 1937, **9**, 429—435).—Cl' diffuses freely in and out of the muscle fibres and sarcoplasm but not into the fibrils. The muscle fibre membrane is readily permeable to Cl' (but not to K) in either direction. The [K] in the muscle is about 15 times that of the normal external medium and diffuses out only when the concn. in the medium is < normal (<0.01N). Above this concn. K diffuses into the muscle. K is normally concn. in the fibrils, which are saturated with it. M. A. B.

**Cobalt as an essential element in animal nutrition.** W. M. NEAL and C. F. AHMANN (Science, 1937, **86**, 225—226).—A malnutrition (microcytic hypochromic anaemia), produced in calves fed on Co-free grass, hay, corn, and dried skim milk, is corr. by Co supplement and is aggravated by Fe<sup>III</sup>NH<sub>4</sub> citrate and CuSO<sub>4</sub>. L. S. T.

**Absorption and excretion of iron.** R. A. McCANCE and E. M. WIDDOWSON (Lancet, 1937, **233**, 680—684).—A review. The capacity of the

bowel to excrete Fe and to control the amount excreted appears to have been greatly exaggerated. A new theory of Fe metabolism is advanced.

L. S. T.

**Absorption and excretion of iron before, during, and after a period of very high intake.** E. M. WIDOWSON and R. A. McCANCE (Biochem. J., 1937, 31, 2029—2034).—Two men and two women were placed on diets containing 7—9 mg. of Fe per day, attained an Fe balance, and then received by mouth about 1 g. of Fe daily. Positive balances were obtained in each case and, after discontinuing the Fe but allowing time for excretion of the unabsorbed Fe from the intestine, net absorptions of 1.5—5 g. of Fe occurred. The subjects were found to be again in Fe equilibrium on low Fe intakes. The body appears therefore to have little or no capacity for excreting Fe. In one woman, the hæmoglobin content rose from 84% (Haldane) to 101% during administration of the large doses but fell again afterwards to its original level.

P. W. C.

**Role of bromine in nutrition.** P. S. WINNEK and A. H. SMITH (J. Biol. Chem., 1937, 121, 345—352).—Rats on an adequate synthetic diet containing <0.5 p.p.m. of Br and others on the same diet supplemented with 16.5—20.2 p.p.m. of Br did not differ in food intake, rate of growth, or reproductive power, but ate less and did not grow as well as rats on a stock diet containing 16.5—20.2 p.p.m. of Br; the females failed to maintain their young. The young of the rats of the first group contained much less Br than did those of the third. The Br content of the rats of the second group was that of those of the third group, the Br:Cl ratio of the diet of the former being that of the diet of the latter. Br is probably not an essential constituent of the diet of the rat.

W. McC.

**Iron retention in infancy.** G. STEARNS and D. STINGER (J. Nutrition, 1937, 13, 127—141).—Infants (7—54 weeks) receiving human milk showed a small positive Fe balance in all cases. With cow milk there was a daily loss of 0.05 mg. of Fe. Ability to retain Fe was unaffected by age. Fe retention was increased by feeding Fe-rich cereals or Fe NH<sub>4</sub> citrate but not by egg-yolk or spinach. No consistent relation was apparent between Fe retention and the intake of K, Ca, or P. An intake of 0.05 mg. per kg. was necessary to ensure any Fe retention and 0.1—0.15 mg. was needed to meet full requirements.

A. G. P.

**Conservation of blood-iron during the period of physiological hæmoglobin destruction in early infancy.** G. STEARNS and J. B. MCKINLEY (J. Nutrition, 1937, 13, 143—156).—Blood-Fe in infants reached min. at 4—6 weeks although excretion continued to exceed intake for a considerable period. A dietary source of Fe is necessary before 6 months o age.

A. G. P.

**Transference of ingested fluorine from parent to offspring.** E. REID and R. G. CHENG (Chinese J. Physiol., 1937, 12, 233—237).—Progressive additions of F either as NaF or as tea infusion (cf. B., 1936, 811) to the diet of pregnant rats caused increasing amounts of F in the offspring as measured

at weaning. Some of the maternal F was transmitted during foetal life.

J. N. A.

**Improved growth of rats on iodine-deficient diets.** R. R. REMINGTON (J. Nutrition, 1937, 13, 223—233).—Subnormal growth of rats receiving a goitrogenic diet (A., 1933, 1322) was improved by partial replacement of wheat-gluten by purified casein (I), dried pig liver, or dried brewer's yeast. (I) carries sufficient I to render it unsuitable for inclusion in goitrogenic diets. On a diet containing wheat-gluten 18, dried pig liver 2, yellow maize meal 78, CaCO<sub>3</sub> 1, NaCl 1% rats attain maturity and produce normal nos. of living young in spite of almost complete absence of I and colloid from the thyroid gland.

A. G. P.

**Proliferation-promoting substances from cells injured by ultra-violet radiation.** G. S. SPERTI, J. R. LOOFBOUROW, and C. M. DWYER (Nature, 1937, 140, 643—644).—The production of these substances has been confirmed (cf. A., 1937, III, 216) by a new technique. Photomicrographs showing the effect on yeast (*S. cerevisiæ*) are reproduced, and the comparative effects of irradiated cells and Kreke's bios prep. are tabulated.

L. S. T.

**Birefringence of muscle and its variation during contraction.** E. BOZLER and C. L. COTTELL (J. Cell. Comp. Physiol., 1937, 10, 165—182).—Variations in birefringence of muscle during contraction and stretching are explained on the basis of variations in the no. of oriented mols.

M. A. B.

**Effect of compression on viscosity of various organic liquids.** U. EBBECKE [with R. HAUBRICH] (Pflüger's Archiv, 1936, 238, 429—440).—The effect of pressure on  $\eta$  is negligible in protein solutions, slight in conc. solutions of sugars, moderately large in egg white, fish glue, starch, and honey, and very large in paraffin, olive, castor, cod-liver, groundnut, and peppermint oils. In the living cell the effect of pressure is, therefore, probably on the fat and lipin constituents and not on the protein or protoplasm.

M. A. B.

**Effect of galvanic current on the envelopes of cells.** FE. SCHEMINZKY and FR. SCHEMINZKY (Biochem. Z., 1937, 293, 256—263).—Currents of 400 v. (10—100 ma.) applied to the membrane of the unfertilised egg of the trout cause a structural change which precedes the pptn. of globulin. Since a layer of H<sub>2</sub>O separates the membrane from the electrode the change occurs when the membrane forms the interface between two conducting media. The change, which is probably accompanied by increased permeability of the membrane, appears to consist of a decrease in the fat and lipin contents of the affected part of the membrane.

W. McC.

**Stimulation of the vagus nerves and secretion of insulin.** A. O. ETCHEVERRY (Compt. rend. Soc. Biol., 1937, 126, 156—159).—In dogs with enervated liver, stimulation of the vagus is accompanied by a slight fall in blood-sugar.

H. G. R.

**Effect of enervation of the pancreas or the liver or of abdominal sympathectomy on sugar regulation in dogs.** A. O. ETCHEVERRY (Compt. rend. Soc. Biol., 1937, 126, 149—151).—Enervation

of the pancreas is similar in effect to vagotomy, whereas no effect was observed in enervation of the adrenals or liver or in the abdominal sympathectomy.

H. G. R.

**Temperature and the growth of [human] hair.** P. EATON and M. W. EATON (Science, 1937, 86, 354).—Data are recorded.

L. S. T.

**Resistance of silkworm eggs to heat.** K. YAMAFUGI and S. GOTO (Bull. Agric. Chem. Soc. Japan, 1937, 13, 79—80).—When heated in  $H_2O$  to  $50^\circ$ , the eggs lose their power of development much quicker than when heated alone. They are practically unchanged at  $40^\circ$ , whilst  $60^\circ$  causes death in 1 min. The action of HCl ( $d$  1.075) at  $40^\circ$  is  $<$ , and at  $50^\circ$   $>$ , that of  $H_2O$  at the same temp. Normal eggs and those produced under unfavourable conditions showed no difference in their resistance.

J. N. A.

**Effect of hydrogen-ion concentration on the induction of polarity in *Fucus* eggs. II. Effect of diffusion gradients brought about by eggs in capillary tubes.** D. M. WHITAKER and E. W. LOWRANCE (J. Gen. Physiol., 1937, 21, 57—70; cf. A., 1937, III, 132).—An egg placed near one end of a close-fitting capillary tube in an initially homogeneous medium develops in a gradient of (a) its own diffusion products and (b)  $O_2$  tension. When initial  $p_H$  is 6.5—7.6, a high % of the eggs develop rhigoid protuberances towards the far end of the tube. Near 8.0 this % drops to 50 and at  $p_H$  8.6 has fallen to  $<25$ . At  $p_H > 9.0$  salts ppt. from the sea- $H_2O$  medium but the % appears to increase rather than decrease. The polarity of the egg is probably determined by (a) rather than (b).

E. M. W.

**Effect of lack of oxygen on cell permeability.** F. R. HUNTER (J. Cell. Comp. Physiol., 1936, 9, 15—27).—Lack of  $O_2$  had no effect on the permeability of ox erythrocytes or of fertilised or unfertilised *Arbacia* eggs to org. compounds.

M. A. B.

**Mechanism of adaptation of free ending tactile receptors in frog skin.** M. A. RUBIN and B. J. SYROCKI (J. Cell. Comp. Physiol., 1936, 9, 29—35).—Pptn. of K in frog skin with MacCallum's cobaltinitrite reagent, followed by microscopical examination, shows that the K occurs almost entirely in the epithelium, with only traces in the deeper layers. Since adaptation is very rapid in free epidermal and very slow in sub-epidermal endings, the observations support Hoagland's hypothesis that adaptation is due to depression of excitability by K which diffuses out of the epithelial cells.

M. A. B.

**Role of tissue spaces in the osmotic equilibrium of frog muscles in hypotonic and hypertonic solutions.** W. O. FENN (J. Cell. Comp. Physiol., 1936, 9, 93—103).—The muscle did not behave as a simple osmometer; about 15% of the fibre- $H_2O$  was osmotically inactive. Chloride spaces were larger in hypertonic than in normal or hypotonic Ringer's solution, but in all cases tended to increase as more fibres became permeable to Cl'. In aq. NaCl or sucrose wt. changes were due entirely to increases in chloride space. In stretched muscle wt. decreased at the expense of the chloride space.

Frequent handling modified the swelling of the muscles.

M. A. B.

**Differential permeability to water and osmotic exchanges in the marine worm *Phascolosoma*.** E. F. ADOLPH (J. Cell. Comp. Physiol., 1936, 9, 117—135).—The body wall is impermeable to electrolytes. Permeability to  $H_2O$  is greater for endosmosis than for exosmosis, but no differential permeability to org. solutes is shown.

M. A. B.

**Chemical reactions in suspension of surviving adipose tissue in Tyrode solution.** J. BAUER (Enzymologia, 1937, 3, 183—184).—Exchanges of sugar and chloride between tissue and solution are more vigorous in the presence of  $O_2$ , but they are greatly decreased if the tissue is denervated.

R. M. M. O.

**Physicochemical factors in anopheline ecology. II. Turbidity, chloride, and iron.** P. I. DE JESUS (Philippine J. Sci., 1937, 62, 125—136).—*Anopheles* species prefer  $[Cl'] < 7$  p.p.m. (no larvae being found where it exceeds 11 p.p.m.),  $Fe < 0.8$  p.p.m., and normally clear  $H_2O$ , although temporary accidental increases in turbidity, e.g., after heavy rainfall, are tolerated.

R. M. M. O.

**Physiology of nematodes.** D. G. DAVEY (Nature, 1937, 140, 645).—Acidity and the toxicity of bile salts are factors that influence the specificity and distribution within the host of the nematodes from the alimentary canal of sheep.

L. S. T.

**Catatonias produced by the introduction of heavy water into the cerebrospinal fluid.** J. B. HERRMANN and H. G. BARBOUR (Science, 1937, 86, 244—245).—Catatonias and other effects produced in rats and cats by administration of  $D_2O$  are described.

L. S. T.

**Potassium in frog skin.** H. B. STEINBACH (J. Cell. Comp. Physiol., 1937, 10, 51—60).—A transport of K from the inside to the outside of frog skin is demonstrated; it appears to occur through the cells rather than through the extracellular spaces.

M. A. B.

**Transport of potassium chloride across the myocardium of *Helix pomatia*.** A. JULLIEN and M. PEILLON (Compt. rend. Soc. Biol., 1937, 126, 16—17).—The transport of KCl from the interior to the exterior is very slow and occurs only when the internal pressure is in excess.

H. G. R.

**Effect of potassium on the aerobic glycolysis of brain tissue with reference to the radioactivity of potassium.** Y. KIMURA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, 33, 231—245).—Pptn. of proteins with  $NaWO_4$  gives more concordant recoveries of  $OH\cdot CHMe\cdot CO_2H$  than when  $CCl_3\cdot CO_2H$  is used.  $U NH_4$  carbonate and  $FeCl_3$  afford  $Fe(OH)_3$  on which most of the U-X is adsorbed. A HCl (1 in 6) solution of the ppt. containing  $CaCl_2$ ,  $AcOH$ , and  $(NH_4)_2C_2O_4$  with aq.  $NH_3$  affords  $CaC_2O_4$  on which 80—90% of U-X is adsorbed. Glycolysis of minced brain is diminished by about 30% in 0.1% KCl, CsCl, and RbCl in contrast with their effects on brain slices (cf. Dickens and Greville, A., 1935, 1013). Preps. of U-X used as substitutes for K in Ringer's solution have no significant effect on the aerobic

glycolysis of brain slices. The K effect is shown only when the cell structure is undamaged. J. L. D.

**Liberation of potassium by muscle subjected to electrotonus as well as muscle stimulated directly and indirectly.** V. BUREAU (Arch. Internat. Physiol., 1937, 45, 40—68).—Liberation of K from muscle subjected to electrotonus or to direct or indirect stimulation is due to ionisation of non-diffusible org. K complexes, the excitability of muscle being due to the ratio between the intra- and extra-fibrillary concn. of K. H. G. R.

**Diffusible and non-diffusible potassium of muscle.** A. REGINSTER (Arch. Internat. Physiol., 1937, 45, 69—74).—The ratio of combined to ionised K in muscle at rest decreases from 2—4 to 1.4—1.8 after prolonged contraction. H. G. R.

**Effect of a low-calcium diet on reproduction in cattle. Effects of further reduction in calcium and removal of vitamin supplements.** L. S. PALMER, C. P. FITCH, T. W. GULLICKSON, and W. L. BOYD (Cornell Vet., 1935, 25, 229—246).—Cows which reproduced normally on a diet containing an average of 0.18% Ca showed no abortion when the Ca content was lowered to 0.12%: the yield, composition, and clotting properties of the milk were unaffected but the total and ultrafilterable Ca of the blood plasma and the ash,  $\text{Ca}_3(\text{PO}_4)_2$ , and  $\text{CaCO}_3$  contents of bones diminished. Withdrawal of cod-liver oil-canned tomato supplements from rations containing 0.18—0.65% of Ca did not affect breeding efficiency, or the yield and composition of milk or composition of muscle; the ash and  $\text{CaCO}_3$  content of bone and plasma-Ca<sup>++</sup> diminished slightly.

CH. ABS. (p)

**Relation of the calcium content of the diet to rate of healing of experimental fractures in rats.** M. A. ROBB (J. Amer. Dietet. Assoc., 1936, 11, 422—427).—Diets deficient in Ca delayed healing, but the supplementing of adequate diets with excessive Ca had no beneficial effect.

CH. ABS. (p)

**Calcium metabolism and therapy.** C. E. HAYDEN (Vet. Alumni Quart., 1935, 22, 124—135).—Injection of Ca salts had no effect on acetonaemia but was beneficial in milk fever. Injection of  $\text{CaCl}_2$  in glucose solution into mammary veins of cows proved toxic.

CH. ABS. (p)

**Coalescence of living cells with oil drops. I. *Arbacia* eggs immersed in sea-water.** R. CHAMBERS and M. J. KOPAC. **II. *Arbacia* eggs immersed in acid or alkaline calcium solutions.** M. J. KOPAC and R. CHAMBERS (J. Cell. Comp. Physiol., 1937, 9, 331—343, 345—361).—I. A non-polar oil (Petrofol) which, in sea- $\text{H}_2\text{O}$ , had an interfacial tension of 38.5—45.5 dynes per cm. independent of  $p_{\text{H}}$  penetrated naked *Arbacia* eggs at all  $p_{\text{H}}$  vals. of the immersion fluids. Polar oils, including cottonseed oil, olive oil, and oleic acid (I), in which interfacial tension increased with decreasing  $p_{\text{H}}$ , penetrated eggs only at low  $p_{\text{H}}$ , i.e., when the tension at the oil/aq. interface was > a crit. val. of about 9.5 dynes per cm.

II. Olive oil and (I) penetrate naked *Arbacia* eggs more readily in acid or alkaline aq.  $\text{CaCl}_2$  than in acid

or natural sea- $\text{H}_2\text{O}$ , probably due to an increase in fluidity of the cell surface, which is assumed to be liquid where penetration occurs. Other cells exist in which the oil does not penetrate but spreads over the cell surface, and here the cell surface is probably solid.

M. A. B.

**Chondrodystrophy in the chick embryo produced by a mineral deficiency in the diet of the hen.** M. LYONS and W. M. INSKO, jun. (Science, 1937, 86, 328; cf. A., 1936, 1541).—Eggs from hens fed on a ration that produces slipped tendon hatch only to an extent of <10%. When  $\text{MnSO}_4$ ,  $\text{ZnSO}_4$ , and  $\text{Fe}^{\text{II}} \text{NH}_4$  sulphate are included in the ration the hatching is good and the chicken are normal. Injection of Mn, but not Zn, into the albumin of the eggs prior to incubation also resulted in normal development of the embryos and in an increase in the no. hatched.

L. S. T.

**Mineral exchanges in homeo-osmotic fish.** A. DRILHON (Compt. rend., 1937, 204, 1502—1503).—In stenohalinetypes, cations accumulate in high concns. in the muscles when the fish is gradually introduced into a hypertonic medium so that blood composition is maintained unaltered. Euryhaline types behave similarly during the first hr. following the change, but the muscle-salt content after passing a max. gradually falls to its original val.

R. M. M. O.

**Effect of adding copper to the exclusive milk diet used in the preparation of anæmic rats, on their subsequent response to iron.** M. C. SMITH and L. OTIS (J. Nutrition, 1937, 14, 365—371).—Rats rendered severely anæmic by whole milk diet contain residual Fe which is converted into hæmoglobin (I) when adequate amounts of Cu are added to the diet. Animals which have not been depleted of iron by Cu administration in the preparational period regenerate much more (I) during Cu-Fe treatment than do those previously receiving enough Cu to cause exhaustion of Fe reserves.

A. G. P.

**Effect of salts of heavy metals on protoplasm.**

**I. Action of cupric chloride on the viscosity of sea urchin eggs.** C. A. ANGERER (J. Cell. Comp. Physiol., 1937, 10, 183—197).— $\text{CuCl}_2$  produces, after a latent period, a decrease of about 36% in  $\eta$  of protoplasm, followed by a rise to an infinite centrifuge val. The rate of change  $\propto$  the  $[\text{Cu}^{++}]$  and for a given  $[\text{Cu}^{++}]$  is more rapid in a Ca-, Mg-, or K-free medium. The min.  $[\text{Cu}^{++}]$  necessary to effect the above changes is  $5 \times 10^{-4}\text{M}$  in a balanced, K-free or Mg-free medium, but only  $10^{-6}\text{M}$  in a Ca-free medium.

M. A. B.

**Speed with which various parts of the body reach equilibrium in the storage of ethyl alcohol.** R. N. HARGER, H. R. HULPIEU, and E. B. LAMB (J. Biol. Chem., 1937, 120, 689—704).—In dogs receiving 3 g. of EtOH per kg. orally or intravenously and examined after intervals of 15 min. to 12 hr., the ratios of  $[\text{EtOH}]$  in various organs to that in brain were: blood,  $1.17 \pm 0.09$ ; liver,  $0.91 \pm 0.07$ ; muscle (after lag lasting 1 hr.),  $0.90 \pm 0.03$ . After equilibrium is attained, the EtOH stored  $\propto$  the  $\text{H}_2\text{O}$  content of the tissues. The average ratio of  $[\text{EtOH}]$  in cerebrospinal fluid to that in blood of 46 men was  $1.18 \pm 0.09$ , or 0.996 when calc. on the basis of  $\text{H}_2\text{O}$  content. A. L.

**Propylene glycol. Rate of metabolism, absorption, and excretion. Determination in body-fluids.** A. L. LEHMAN and H. W. NEWMAN (J. Pharm. Exp. Ther., 1937, 60, 312—322).—Propylene glycol (I) is determined by oxidation with  $\text{NaIO}_4$  after pptn. of glucose with  $\text{Ba(OH)}_2$  in EtOH. (I) is rapidly absorbed from the gastro-intestinal tract of dogs. Large doses taken orally do not produce hæmoglobinuria. Toxicity and narcotic actions are < half those of EtOH. E. M. W.

**Changes in bones due to poisoning by iodoacetic acid.** F. VERZAR and M. LASKOWSKI (Biochem. Z., 1937, 292, 312—318).—Complete inhibition of growth for 4 weeks in rats due to administration of  $\text{CH}_2\text{I-CO}_2\text{H}$  is accompanied by absence of change in the Ca, ash, and  $\text{H}_2\text{O}$  contents of the bones; with partial inhibition, the vals. correspond with those of normal rats of equal body-wt. With inhibition of growth due to starvation, however, Ca is deposited and the  $\text{H}_2\text{O}$  content decreases. F. O. H.

**Halogenated hydrocarbons. Toxicity and potential dangers.** W. F. VON OETTINGER (J. Ind. Hyg., 1937, 19, 349—448).—A review of the literature. Narcotic action, depressant effect on heart, antiseptic action, toxicity with oral, subcutaneous, and intravenous administration, and hepatotoxic properties are given for chlorinated hydrocarbons ( $\text{C}_{1-4}$ ). J. N. A.

**Action of trihydroxystercholeonic acid on pancreatic lipase and on blood corpuscles.** H. MAKINO (Arb. Med. Fak. Okayama, 1935, 4, 508—511).—The acid accelerates pancreatic lipolysis less efficiently than does cholic acid but it is a more active hæmolysin. CH. ABS. (p)

**Effects of inhalation of smoke from common fuels.** L. SCHNURER (Amer. J. Publ. Health, 1937, 27, 1010—1022).—Rabbits and rats were exposed for 80 days to products of combustion of coke, anthracite, and bituminous coal. There was a gain in wt. in every case, and the % of hæmoglobin and no. of erythrocytes and leucocytes increased, the increase being greatest when bituminous coal was used, and least with anthracite. Phagocytosis of the C pigment in the lungs was slight in the case of anthracite and very great with bituminous coal. The products from anthracite and coke caused no fibrosis of the lungs, but early stages were noticed with bituminous coal. J. N. A.

**Fractional phthalein test [of kidney function].** E. M. CHAPMAN (New England J. Med., 1936, 214, 16—18).—Delay in dye excretion following injection of phenolsulphonephthalein is reflected chiefly in the output after 15 min. Tests made after 15—30 min. have the greatest significance. Failure of the test in certain diseases is recorded. CH. ABS. (p)

**Resorptive permeability of the toad's ureter towards several diffusible acid dyes studied by intraglomerular micro-injection.** L. LISON (Compt. rend. Soc. Biol., 1937, 126, 56—58).—The cells of the brush segment are permeable to diffusible dyes in both directions. H. G. R.

**Elimination of neutral-red by the frog's kidney.** R. CHAMBERS and R. T. KEMPTON (J. Cell.

Comp. Physiol., 1937, 10, 199—221).—Larger amounts of neutral-red (I) are eliminated in an acid than in an alkaline urine.  $p_H$  of urine and elimination of (I) are unaffected by perfusion of caffeine through the aorta. Urinary  $p_H$  is increased and elimination of (I) decreased by perfusion with KCN or  $\text{NH}_2\text{-CO}_2\text{Et}$  (III). The effect of KCN and (III) is neutralised by  $\text{NH}_4\text{Cl}$ . M. A. B.

**Taste and chemical constitution. Naphthoisotriazine group.**—See A., II, 523.

**Bulbar centre of carbohydrate metabolism in dogs deprived of their humoral sugar-regulating mechanism.** A. LE GRAND, J. COUSIN, and P. LAMIDON (Compt. rend. Soc. Biol., 1937, 126, 37—38).—The centre of carbohydrate metabolism (A., 1937, III, 212) can be stimulated by induced hyperglycæmia. H. G. R.

**Spleen and carbohydrate metabolism.** X. TSCHAHOVITSCH, R. BEROVITSCH, and M. VITSCHNITSCH (J. Physiol. Path. Gen., 1935, 33, 1114—1119).—Injection of digestion products of the spleen (obtained *in vitro* by digestive enzymes) increased blood-sugar in dogs and rabbits. Splenectomised dogs responded similarly. CH. ABS. (p)

**Action of meat extracts and related substances as gastric stimulants in man.** W. R. BOON (Brit. Med. J., 1937, 412—413).—The  $\text{H}_2\text{O}$ -sol. fraction of meat is nearly as effective as whole meat in stimulating the flow of gastric HCl. Whole meat (beef powder) is the only substance examined which increased the flow of pepsin. Na glutamate has no stimulative action but causes rapid emptying of the stomach. A. G. P.

**Action of extract of the brown fatty tissue of the hibernating hedgehog.** C. F. WENDT (Z. physiol. Chem., 1937, 249, IV).—The basal metabolic rate of rats is reduced by 20—30% by injection of extract of the tissue, which also causes a 28% decrease in the blood pressure in rabbits. The effects are not due to the extract as a whole but to one or more of its constituents. W. McC.

**Cholesterol content of the adrenal cortex during experimental hypercholesterolaemia in normal and splenectomised animals.** A. LIGAS (Arch. Farm. speriment., 1937, 64, 164—170).—Ingestion of cholesterol by normal rabbits increases the wt., vol., and cholesterol (I) content of the adrenal cortex: the increase in (I) is greater in splenectomised rabbits. F. O. H.

**Selective toxicity of lipins of organs. Variation in the intensity of hepatic lesions in guinea-pigs following injection of lipins from guinea-pig liver according to the solvent used for extraction.** J. F. MARTIN, P. E. MARTIN, and R. RECEVEUR (Compt. rend. Soc. Biol., 1937, 126, 18—19).— $\text{CHCl}_3$  and  $\text{C}_5\text{H}_{11}\text{-OH}$  fractions are less toxic than  $\text{COMe}_2$  and EtOH fractions. H. G. R.

**Action of drugs on pulmonary circulation.** P. ALCOCK, J. L. BERRY, and I. DE B. DALY (Quart. J. Exp. Physiol., 1935, 25, 369—392).—Effects of acetylcholine and adrenaline on pulmonary pressure are examined. CH. ABS. (p)

**Modification of the effect of acetylcholine on the right auricle of the tortoise as a function of the  $\pi$ .** A. OURY (Arch. Internat. Physiol., 1936, 44, 121—124).—The max. reaction to acetylcholine is between  $p_{\pi}$  7.2 and 7.5. H. G. R.

**Reaction of the coronary artery to acetylcholine.** W. BARTSCH (Pflüger's Archiv, 1936, 238, 296—306).—The effect of acetylcholine is antagonised by atropine but not by adrenaline. M. A. B.

**Effect of gastric juice and of bile on cyclops infected with guinea-worm larvæ.** S. SUNDAR RAO (Indian J. Med. Res., 1936, 24, 535—540).—Cyclops are killed rapidly by 0.025% HCl, or by gastric juice with total acid concn. 0.026—0.15%; the guinea-worm larvæ are activated. R. N. C.

**Activation of tissue-growth (*in vitro*) with cobra-venom.** R. N. CHOPRA, N. N. DAS, and S. N. MUKHERJEE (Indian J. Med. Res., 1936, 24, 267—271).—The venom stimulates growth at higher dilutions and inhibits it at lower dilutions, possibly due to the effects of different types of enzyme actions on fibrin and the products of such actions. R. N. C.

**Liberation of histamine from the perfused lung by snake venoms.** W. FELDBERG and C. H. KELLAWAY (J. Physiol., 1937, 90, 257—280).—The venoms of the Australian copperhead, Indian cobra, and American rattlesnake cause the appearance of coagulable protein (I) and histamine (II) in the perfusates when injected into perfused guinea-pigs' and cats' lungs. The amounts of (I) and (II) liberated increase with the amount of the injection, and copperhead venom is the most active. The (II) liberated is part of the (II) content of the lungs, and with large doses of the venom depletion can become almost complete. R. N. C.

**Liberation of histamine from the perfused lung by staphylococcal toxin.** W. FELDBERG and E. V. KEOGH (J. Physiol., 1937, 90, 280—287).—Staphylococcal toxin causes liberation of histamine (I) from cats' and guinea-pig's lungs after a latent period of 10—40 min., 4—15% of the total (I) being lost. R. N. C.

**Liberation of histamine from the perfused lung by peptone.** W. FELDBERG and W. J. O'CONNOR (J. Physiol., 1937, 90, 288—295).—Peptone causes liberation of 1—3% of the total histamine from the lungs of guinea-pigs, and 2—10% from cats. A second injection causes a further output. R. N. C.

**Bronchodilating substance from earthworms.** T. Q. CHOU, C. C. CHANG, and H. P. CHU (Chinese J. Physiol., 1937, 12, 147—153).—A cryst. nitrogenous substance, m.p.  $>320^{\circ}$  (hydrochloride, m.p.  $>320^{\circ}$ ), was isolated from earthworms obtained from the province of Kwangtung. It resembles adenosine in its actions on bronchial muscle, blood pressure, and intestine. J. N. A.

**Oesophageal and gastric secretion in the frog.** M. H. F. FRIEDMAN (J. Cell. Comp. Physiol., 1937, 10, 37—50).—Adrenaline stimulates secretion of (a) pepsin (I) by frog oesophageal glands, and of (b) (I) and acid by gastric glands. Pilocarpine and

acetylcholine are without effect on both (a) and (b). Histamine stimulates (a), but only acid secretion in (b). M. A. B.

**Tonus of the diaphragm and its relation to smooth muscle tonus in the lungs.** F. VERZAR, L. SZECSENYI-NAGY, C. HAFETER, and H. WIRZ (Pflüger's Archiv, 1936, 238, 387—403).—Adrenaline (I) in doses sufficient to raise the blood pressure decreases the tonus of the diaphragm and increases lung vol. Large doses completely arrest respiration. Very small doses (1—10  $\mu$ g.) may increase tonus. "Pituglandol," an anterior pituitary extract, ephedrine, and acetylcholine (II) also decrease diaphragm tonus. In contrast to (I), the last three decrease blood pressure and (II) does not arrest respiration. Eserine, prostigmine, and histamine (only in lethal doses) produce the same effects as (II). M. A. B.

**cycloPropane for anaesthesia.** Report of Council. ANON. (J. Amer. Med. Assoc., 1936, 106, 292). CH. ABS. (p)

**Clinical use of cyclopropane and tribromoethanol in amylene hydrate.** P. M. WOOD (J. Amer. Med. Assoc., 1936, 106, 275—279).—Use of cyclopropane in anaesthesia is considered. CH. ABS. (p)

**Relationship between activity, chemical structure, and physico-chemical properties of various anaesthetics.** N. V. LAZAREV and A. BROUSSILOVSKA (Bull. Soc. Chim. biol., 1937, 19, 1173—1193).—Linking a saturated C chain into a polymethylene ring structure, conversion of this into an aromatic ring, introduction of double and triple linkings and of OH groups all lead to a decrease of anaesthetic activity. The introduction of halogens does not materially increase but often slightly decreases anaesthetic activity. P. W. C.

**Anæsthetic effects of some N-arylbarbituric acids containing dye-forming groups.** A. M. HJORT, D. W. FASSETT, and E. J. DEBEER (Science, 1937, 86, 291—292).—Intraperitoneal injection into albino mice produced varying effects. 1-*p*-benzeneazo-, 1-*m*- or -*p*-4'-aminobenzeneazo-, 1-*m*- or -*p*-4'-aminonaphthaleneazo-phenyl-5 : 5-diethylbarbituric acids induce true anaesthesia. The 1-*p*- and 1-*m*-2'-azo- $\alpha$ -naphthol-5'-sulphonic acid, derivatives cause a mixed effect in which a convulsive element masks the anaesthetic, and the 1-*p*- and 1-*m*-4'-hydroxynaphthaleneazo-acids are inert. Only the dyes that induce anaesthesia stain the brain tissue as well as the general tissues. L. S. T.

(A) Ether narcosis, blocking of the reticulo-endothelial system, and tissue-chloride. (B) Ether narcosis and tissue-chloride. S. RIOLO (Boll. Soc. ital. Biol. speriment., 1937, 12, 294—295, 295—296).—(A) Blocking of the reticulo-endothelial system in rabbits has no significant effect on the Cl' content of liver, brain, kidney, spleen, heart, lung, or muscle; with simultaneous Et<sub>2</sub>O narcosis, that of the kidney and lung is increased.

(B) Et<sub>2</sub>O narcosis in rabbits increases the Cl' content of kidney and lung and decreases that of the

blood; lethal narcosis slightly increases that of cardiac tissue.

F. O. H.

**Determination of some volatile narcotics in tissues.** A. I. BRUSILOVSKAJA and T. V. STARITZUINA (J. Physiol. U.S.S.R., 1935, 18, 935—939).—The tissue, powdered in liquid air, is aerated in a saturated solution of picric acid. The narcotic is passed through a combustion furnace and the  $\text{CO}_2$  is determined conductometrically.

CH. ABS. (p)

**Chemical investigation and medicinal application.** A. BINZ (Ber., 1937, 70, [4], 127—140).—A lecture dealing with chemical products for combating neurosyphilis and sepsis and the recent developments of  $\text{C}_5\text{H}_5\text{N}$  chemistry in chemodiagnostics.

H. W.

**Pharmacology of natural and synthetic camphor.** B. V. CHRISTENSEN and H. J. LYNCH (J. Amer. Pharm. Assoc., 1937, 26, 786—794).—Natural and synthetic camphor (I) have similar pharmacological properties. Any differences are mainly quantitative, synthetic (I) having a more pronounced action; thus the min. lethal dose in rats is 1.7 and that of natural (I) 2.2 mg. per g.

F. O. H.

**Pharmacological action of camphor and its derivatives.** R. N. CHOPRA, J. S. CHOWHAN, and N. DE (Indian J. Med. Res., 1936, 24, 249—255).

R. N. C.

**Comparison of the pharmacological syndromes of ergometrine and the ergotoxine group of ergot alkaloids.** M. R. THOMPSON (J. Amer. Pharm. Assoc., 1937, 26, 805—816).—The properties of ergometrine (ergostetrine) (I) and of the ergotoxine (II) group [(II), ergotamine, sensibamine, and ergoclavine] indicate that the action of both (I) and the (II) group is not confined to the sympathetic nerve endings stimulated by adrenaline. The predominating stimulatory action of (I) and paralyzing action of the (II) group are discussed.

F. O. H.

**Action of ajmaline on nerve impulses.** R. N. CHOPRA, N. N. DAS, and S. N. MUKHERJEE (Indian J. Med. Res., 1937, 24, 1125—1130).

R. N. C.

**Control of post-operative urinary retention with doryl.** R. OFFICER and J. C. STEWART (Lancet, 1937, 233, 850—851).—Carbamylcholine chloride produces a marked but short-lived rise of intravesical pressure and, in certain cases, relieves post-operative retention of urine.

L. S. T.

**Physiological action of drastic purgatives. I. Resins of the Convolvulaceæ.** G. VALETTE (Bull. Sci. Pharmacol., 1937, 44, 328—340).—Bile or solutions of Na cholate, glyco- and tauro-cholate dissolve 19 times more lecithin in presence of convolvulin (I), jalapin (II), and scammonin (III). The hæmolytic action of bile salts is increased up to 2800 times by (I), (II), and (III). (II) is 3—3.8 times as active as (I) (cf. A., 1918, i, 467). (I), (II), and (III) when hydrolysed by  $\text{Ba}(\text{OH})_2$  afford (details given) convolvulinic (IV) [purgic acid (V) is also formed], jalapic, and scammonic acid (VI), respectively. Unlike (V) and (VI), (IV) has no hydrotropic action on lecithin. The hæmolytic activity of the acids is < that of the parent resins. Scammonic acid, obtained by acid hydrolysis of (VI), has 0.14 times the hæmolytic action of the latter.

J. L. D.

**Physiology and pharmacology of the autonomic nervous system. XXII. Sensitisation of adrenaline by antioxidants. XXIII. Liberation of sympathine by chemical stimulation of the sympathetic ganglia. XXV. Role of the liver and abdominal viscera in destruction of adrenaline.** Z. M. BACQ (Arch. Internat. Physiol., 1936, 44, 15—23, 112—120; 1937, 45, 1—5).—XII. The nictating membrane is sensitised to epinine and adrenaline (I) by pyrogallol and the inhibiting action of (I) on the virgin cat's uterus is prolonged. These effects are augmented by enervation, probably due to an increase in fixation of phenolic substances by the tissues.

XXIII. Injection of nicotine or large doses of acetylcholine into the adrenalectomised cat stimulates the sympathetic ganglia with consequent liberation of sympathine.

XXV. Destruction of (I) does not occur in the abdominal viscera and liver *in vivo* as in other tissues.

H. G. R.

**Pharmacology of sodium tetramethylammonium glycerophosphate.** L. DONATELLI and P. PRATESI (Boll. Soc. ital. Biol. sperim., 1937, 12, 349—350).—The pharmacological properties of the compound include those due to the  $\text{NMe}_4$  group, e.g., curare-like action, effect on the vagus, and inhibition of the respiratory centre.

F. O. H.

**Sex-difference in rats in tolerance to barbiturates and nicotine.** H. G. O. HOLCK, M. A. KANAN, L. M. MILLS, and E. L. SMITH (J. Pharm. Exp. Ther., 1937, 60, 323—346).—Male rats are more resistant than female to certain barbiturates (I), especially those having one short and one long forked (not *iso*) chain or a cyclohexenyl or methylated N group. This effect is not shown by other animals tested except by mice to picroton. Castration of male rats increases, and administration of male hormone to spayed or normal female or castrated male rats decreases, recovery time from hypnosis due to (I) showing sex-differences.

E. M. W.

**Curare-like action of extracts of *Erythrina crista galli*.** V. H. CICARDO and E. HUG (Compt. rend. Soc. Biol., 1937, 126, 154—156).—The active material is probably an alkaloidal base.

H. G. R.

**Anisylsparteine.**—See A., II, 526.

**Alkaloid of the Chinese drug "Kuh-Seng."**—See A., II, 526.

**Chemistry of the vegetable cardiac poisons, toad venoms, and saponins of the cholane group.** R. TSCHESCHE (Ergebn. Physiol., 1936, 38, 31—72).—A review.

W. McC.

**Biological assay of digitalis preparations in the tropics. VI. Comparative effects of *Digitalis lanata*, Ehrh., from Austria and Kashmir, and standard digitalis powder (B.P. 1932) on the mammalian heart.** R. N. CHOPRA, J. S. CHOWHAN, and J. C. GUPTA (Indian J. Med. Res., 1936, 24, 509—515).

R. N. C.

**Plants used by the Indians against snake venom and malaria.**—See A., II, 511.

**Pharmaceutical applications of furfuraldehyde.**—See A., II, 524.

**Actions of neostibosan, urea-stibamine, and histamine on the frog's heart.** N. M. BASU (Indian J. Med. Res., 1937, 24, 1131—1135).

R. N. C.

**Isolation of organic poisons [from viscera etc.].** C. P. STEWART, S. K. CHATTERJI, and S. SMITH (Brit. Med. J., 1937, 790—792).—The minced material is treated with  $\text{CCl}_3\text{-CO}_2\text{H}$ . Alkaloids in the fat- and protein-filtrate may be adsorbed on kaolin and subsequently eluted with hot  $\text{CHCl}_3$ . After separation of alkaloids veronal is adsorbed on C and eluted with  $\text{Et}_2\text{O}$ .

A. G. P.

**Chemical constitution and physiological action.** I. Hydro-aromatic compounds. A. TORBOLI. II. Linkings in the side-chain. I. BARNUCCI (Boll. Soc. ital. Biol. sperim., 1937, 12, 368—369, 370).—I. The toxic properties of cyclohexene in rabbits are slightly more marked than those of cyclohexane.

II. The toxicity to frogs of  $\text{CPh:C-CO}_2\text{H}$  (I),  $\text{CHPh:CH-CO}_2\text{H}$  (II), and  $\text{Ph:[CH}_2\text{]}_2\text{-CO}_2\text{H}$  (III) decreases in the order named. The action of increasing the leucocyte count in rabbits, however, gives the order (II) > (III) > (I).

F. O. H.

**Cyanide poisoning. Toluylene-red as antidote.** P. SALVI (Riv. Biol., 1937, 23, 211—220).—Toluylene-red (I) (as hydrochloride) has a preventive, but not curative, action in  $\text{CN}'$  poisoning in dogs. The antidotal action is due to  $\text{CN}'$  forming complex ions with (I).

F. O. H.

**Two cases of arsenical poisoning.** L. VAN ITALLIE (J. Pharm. chim., 1937, [viii], 26, 289—292; cf. A., 1937, III, 138).—Nails contained 39 mg. and hair up to 7 mg. of  $\text{As}_2\text{O}_3$  per 100 g. (basal part 2 mg.; apical part 7 mg.). The As, which is held tenaciously by all ectodermal parts, is excreted slowly in the urine.

J. L. D.

**Pharmaceutically important arsenic compounds.**—See A., II, 491.

**Relative hypnotic effects of some carbamides of varied types.**—See A., II, 491.

**Elimination of selenium and its distribution in the tissues.** M. I. SMITH, B. B. WESTFALL, and E. F. STOHLMAN, jun. (U.S. Publ. Health Repts., 1937, 52, 1171—1177).—From 50 to 80% of the total intake of Se is excreted in urine and from 0 to 18% in faeces, more being excreted in faeces when given orally. A correlation exists between urinary Se and a daily dose administered in chronic Se poisoning. In chronic poisoning, Se is widely distributed in the tissues and is found in highest concns. in liver, kidney, heart, and lungs. Stored Se is excreted in 14 days but some persists in the liver for 30 days.

W. L. D.

**Toxicology of selenium. IV. Toxicity of hydrogen selenide.** H. C. DUDLEY and J. W. MILLER (U. S. Publ. Health Repts., 1937, 52, 1217—1231).—Guinea-pigs were exposed to  $\text{H}_2\text{Se}$  in concns. of 0.02—0.57 mg. per litre for 10—60 min. Animals exposed to 0.57 mg. per litre died in 5 days, and those

CC (A., III.)

exposed to 0.02 mg. per litre for 60 min. within 25 days.

W. L. D.

**Influence of total extracts of kidney on the toxicity of copper.** L. CALLEGARI (Boll. Soc. ital. Biol. sperim., 1937, 12, 333—334).—Injection of aq. glycerol extracts of kidney greatly increases the toxicity of  $\text{Cu}^{++}$  (injected after 15 min.) in rabbits and frogs.

F. O. H.

**Retention of phenols in blood in a case of mercuric chloride poisoning.** M. R. CASTEX and A. F. ARNAUDO (Separate, 1934, 18 pp.).—In  $\text{HgCl}_2$  poisoning retention of phenols followed that of urea and was accompanied by increase of phenols in spinal fluid.

CH. ABS. (p)

**Chronic zinc poisoning of pigs [due to] feeding of zinc lactate.** R. E. R. GRIMMETT, I. G. MCINTOSH, E. M. WALL, and C. S. M. HOPKIRK (New Zealand J. Agric., 1937, 54, 216—223).—Pigs fed regularly on milk containing 0.1% of Zn (as lactate) became lame and ill-conditioned. An accumulation of 0.1—0.2% of Zn occurred in the (damaged) kidney, liver, and the lower end of the leg bones.

W. L. D.

**Effects of ingestion of fluorides on teeth, bones, blood, and tissues of albino rats.** J. A. SCHULZ (Iowa Agric. Exp. Sta. Rept. Agric. Res., 1934, 51).—Feeding of F' may induce gross physical deterioration of bones and teeth with only minor changes in composition.

CH. ABS. (p)

**Balance experiments with fluorspar on rats.** R. G. CHENG and E. REID (Chinese J. Physiol., 1937, 12, 223—231).—F in  $\text{CaF}_2$  has about 1/40 of the toxicity of other F compounds as judged by its effect on teeth. Increasing the amount of  $\text{CaF}_2$  in the diet also increases the urinary and faecal excretion of F, but the amount excreted is always a diminishing fraction of that ingested. Balance experiments over long periods of time are untrustworthy. The relatively low toxicity of  $\text{CaF}_2$  may be due to its low solubility in digestive fluids.

J. N. A.

**Basis of the principle of the master reaction in biology.** A. C. BURTON (J. Cell. Comp. Physiol., 1936, 9, 1—14).—In a chain of two irreversible unimol. reactions, the ratio of the velocity coeffs. must be  $\leq 7:1$  in order that the slower reaction may come within 10% of being a true master reaction. In longer chains the relative slowness of a reaction must be even greater. On this basis, for mastery of one reaction at  $0^\circ$  and of another at  $40^\circ$ , the crit. increments of the two reactions must differ by  $\leq 16,000$  g.-cal. if the Arrhenius law of change of velocity with temp. holds. A straight-line Arrhenius graph is not evidence that a master reaction is in control. In the steady state the principle of the master reaction has no application.

M. A. B.

**"Master reactions" and temperature characteristics.** H. HOAGLAND (J. Cell. Comp. Physiol., 1937, 10, 28—36).—Reply to criticisms. M. A. B.

**Influence of radiation on enzymes and enzymic processes.** G. CRONHEIM (Enzymologia, 1937, 3, 115—137).—Previous work is reviewed. Somewhat

irregular results are reported from fresh work on several different types of enzyme system.

R. M. M. O.

**Mechanism of the regulation of chemical processes in the organism.** S. J. VON PRZYŁECKI (*Enzymologia*, 1937, 3, 153—163).—A theoretical discussion.

R. M. M. O.

**Glucose oxidase.** I. W. FRANKE and F. LORENZ (*Annalen*, 1937, 532, 1—28; cf. Muller, A., 1928, 1291).—The enzyme (I) from *Aspergillus niger* or *Penicillium glaucum* oxidises glucose (II) to gluconic acid. The rate of the (unimol.) reaction  $\propto$  concn. of (I), is optimal at  $p_H$  6, and in  $O_2$  is  $>$  that in air. (I), which is sp. for (II), is slightly (6—16%) inhibited at  $p_H$  7 and to a greater extent (25—69%) at  $p_H$  4.4 by various narcotics, whilst substances (HCN,  $H_2S$ ,  $NaN_3$ ,  $NH_2OH$ ) reacting with heavy metals either have no effect or accelerate [with production (dependent on  $p_H$ ) of  $H_2O_2$ ] the reaction;  $N_2H_4$  and  $NaHSO_3$  are inhibitory.  $p$ - $C_6H_4(NH_2)_2$ , especially with horseradish peroxidase, accelerates the oxidation; a similar acceleration occurs with benzoquinone and indophenol derivatives as H acceptors. The properties of (I) indicate it to be not an oxidase but a dehydrogenase.

F. O. H.

**Tyramine oxidase.** H. I. KOHN (*Biochem. J.*, 1937, 31, 1693—1704).—The prep. of tyramine oxidase (I) from pig's liver is described. (I) does not require a co-enzyme. The rate of oxidation of tyramine decreases with increase of  $[H^+]$ . (I) catalyses the oxidation of primary, *sec.*, and *tert.* amines to the corresponding aldehyde,  $H_2O_2$ , and  $NH_3$ . That neither the  $C_6H_5$  ring nor its phenolic nature is necessary is shown by the oxidation of  $NH_2 \cdot [CH_2]_2 \cdot Ph$  and *iso*amylamine by (I). 0.01M-CN',  $-CH_2I \cdot CO_2H$ , or  $-N_2H_4$  does not inhibit the oxidation. Adrenaline oxidase and (I) are probably the same.

P. G. M.

**Adrenaline and amine oxidase.** D. RICHTER (*Biochem. J.*, 1937, 31, 2022—2028).— $NH_2 \cdot [CH_2]_2 \cdot Ph$ , tyramine, and arterenol on oxidation with the amine-oxidase of guinea-pig's liver and intestine form  $NH_3$ , adrenaline, epinine, and sympatol give  $NH_2Me$ , alkamine gives  $NH_2Et$ , and hordenine  $NHMe_2$ ; in each case an aldehyde is also produced. The quaternary salt *N*-methylhordenine chloride was not oxidised.

P. W. C.

**Glycerophosphoric dehydrogenase.** H. WEIL-MALHERBE (*Nature*, 1937, 140, 725—726).—A powerful dehydrogenating enzyme has been prepared from horse brain using pyocyanine as carrier. Addition of co-enzyme I to this dehydrogenase does not affect its ability to take up  $O_2$ . Only 0.5 mol. of  $O_2$  is taken up per mol. of  $\alpha$ -glycerophosphoric acid with or without co-enzyme I. In presence of CN',  $O_2$  uptake is practically doubled.

L. S. T.

**Heavy metal-protein and pyridine-protein complexes as the components of alcohol dehydrogenase sensitive to hydrocyanic acid and carbon monoxide.** F. KUBOWITZ (*Biochem. Z.*, 1937, 293, 308; cf. A., 1937, III, 427; Negelein, *ibid.*, 180).—When pyrocatechol and diphosphopyridine-protein (I) are added to an aq. EtOH solution of Cu-protein (II) containing  $O_2$ , EtOH is converted into

MeCHO, the hydrogenated  $C_5H_5N$  is dehydrogenated (by *o*-quinone) and Cu is re-oxidised by  $O_2$ , so that (I) and (II) are re-produced and EtOH and  $O_2$  disappear. The process is inhibited by KCN and by CO.

W. McC.

**Enzymic conversion of codehydrogenase-I into -II.** R. VESTIN (*Naturwiss.*, 1937, 25, 667—668).—The conversion of codehydrogenase-I (Harden's cozymase) into -II (Warburg's erythrocyte respiration enzyme) is effected enzymically using washed dried yeast as the source of enzyme and an excess of adenosinetriphosphoric acid as  $PO_4$  donor. The formation of -II is max. after 30 min. at 30° and the  $p_H$  optimum is 7—8. The abs. amount of -II formed corresponds with only 10% of the cozymase used. The product is active in the dehydrogenation of hexose monophosphate.

P. W. C.

**Cytochrome-*b*. Isolation, properties, and role in the reaction mechanism of cellular respiration.** E. YAKUSHIJI and T. MORI (*Acta Phytochim.*, 1937, 10, 113—123).—The reduction of the three cytochrome (I) components of washed dried yeast by alcohol-dehydrogenase (II) is always dependent on the presence of cohydrogenase (III). Oxycytochrome-*c* (IV) is reduced by  $C_5H_5N$ -hæmin but not by dihydrocodehydrogenase (V). The prep. and properties of (I)-*b* are described. Addition of  $C_5H_5N-Na_2S_2O_4$  to a solution of (I)-*b* gives a typical  $C_5H_5N$ -protohæmochromogen spectrum. A protein prep. from yeast gives with protohæmatin a hæmochromogen which is difficult to distinguish spectroscopically from reduced (I)-*b*. (I)-*b* retards reduction of methylene-blue by (II)—(III), the action increasing with increasing addition of flavoproteins. Oxidised (I)-*b* can be reduced both by (II)—(III) and by lactic dehydrogenase-lactate. Reduced (I)-*b* reacts smoothly with (IV). (I)-*b* catalyses the reaction between (V) and (IV). The mechanism of respiration appears most probably to involve the system  $O_2$ —(I)-*c*—(I)-*b*—(III)—(II)—substrate.

P. W. C.

**Photometric determination of peroxidase and phenolase.** L. BARTA (*Biochem. Z.*, 1937, 293, 228—230).—Willstatter's procedure is improved by using a photometer in place of a colorimeter and clarifying the  $Et_2O$  solution of purpurogallin with 2—4 vol.-% of EtOH.

W. McC.

**Peroxidases. I. Photo-electric comparator for the study of colour development as a function of the time.** P. FOURMARIER, jun., and M. FLORKIN (*Arch. Internat. Physiol.*, 1936, 44, 35—37).

H. G. R.

**Catalase of the blood of silkworms bred under unfavourable conditions.** K. YAMAFUJI, S. GOTO, and N. IIO (*Biochem. Z.*, 1937, 293, 305—307; cf. A., 1936, 1554).—In silkworm larvæ insufficient ventilation and exposure to increased temp. and humidity cause reduction in the catalase (I) content of the blood. The reduced (I) val. persists during the period in which no food is consumed. In larvæ of the following generation the (I) content of the blood returns to normal if development proceeds under favourable conditions.

W. McC.

**Inhibition of catalase action by polyphenols and aromatic polyamines.** E. YAKUSHIJI (Bot. Mag. Tokyo, 1937, 51, 299—302).—The activity of catalase, prepared from ox liver, was reduced 50% by M/900,000 pyrogallol, M/100,000 pyrogallol-4-carboxylic acid, M/25,000 gallic acid, M/20,000 pyrocatechol, M/12,000 quinol, M/5000 resorcinol, M/12,000  $p\text{-C}_6\text{H}_4(\text{NH}_2)_2$ , M/4000  $m\text{-C}_6\text{H}_4(\text{NH}_2)_2$ , M/6000  $p\text{-cresol}$ , or M/8000  $\alpha\text{-C}_{10}\text{H}_7\text{NH}_2$ .

W. O. K.

**Hepatic arginase. Relationship to production of urea during the autolysis of the liver of vertebrates.** A. CLEMENTI (Enzymologia, 1937, 4, Part II, 205—216).—Formation of urea occurs during autolysis at  $p_{\text{H}}$  8.0—8.5 of the liver [which contains arginase (I)] of fish, amphibia, chelonina, and mammals but not of the liver [which contains no (I)] of reptiles (other than chelonina) and birds.

F. O. H.

**Effect of *post mortem* autolysis on the activity of hepatic arginase.** G. FLORENCE and D. VINCENT (Compt. rend. Soc. Biol., 1937, 126, 11—13).—The arginase content remains const. for 2 months after death, decreases by 50% in 4—5 months, and disappears completely after 13—14 months.

H. G. R.

**Fumarases. Existence of malic dehydrase.** K. P. JACOBSON and M. SOARES (Enzymologia, 1937, 3, 164—169).—The term fumarase is used to cover all enzymes acting on fumaric acid, which is regarded as a pivotal point in metabolism. In resting *B. coli* a malic dehydrase probably exists since decolorisation of indicators is accelerated by malate with a  $p_{\text{H}}$  relation distinct from that of the increased activity associated with the addition of fumarate itself.

R. M. M. O.

**Enzymic equilibrium in presence of heavy water. Fumarases.** A. PEREIRA-FORJAZ, K. P. JACOBSON, and J. TAPADINHAS (Bull. Soc. Chim. biol., 1937, 19, 1194—1199).—The equilibria established by fumarase and aspartase are not materially altered when  $\text{H}_2\text{O}$  is replaced by a medium containing 99.6% of  $\text{D}_2\text{O}$ .

P. W. C.

**Inhibition of fumarase action by heparin.** A. FISCHER and H. HERRMANN (Enzymologia, 1937, 3, 180—182).—The inhibition occurs only at  $p_{\text{H}}$  5.5—6.0, increasing steeply towards the lower  $p_{\text{H}}$ . Nucleic acid, chondroitin-sulphuric acid, and inactivated heparin are less potent. Heparin forms an irreversible association with fumarase on heating.

R. M. M. O.

**Enzymic production of benzamide and hippuric acid.** H. WAELSCH and A. BUSZTIN (Z. physiol. Chem., 1937, 249, 135—156; cf. A., 1935, 1409).—The liver, kidney, blood, and possibly the small intestine (but not the muscles, adrenal glands, or large intestine) of the horse contain an enzyme, benzamide (I), which converts added  $\text{BzOH}$  into  $\text{NH}_2\text{Bz}$ . (I) exhibits optimal activity at  $p_{\text{H}}$  7.3 with  $[\text{BzOH}]$  0.002M. The action of (I) is inhibited by glycine (II), higher  $[\text{BzOH}]$ , 0.002M-KCN, 0.01M- $\text{H}_2\text{S}$ , 0.008M-glutathione (III), and 0.004M-cysteine (IV), stimulated by 0.004M-(III) and 0.001M-(IV), and not affected by cystine, glutamic acid, and ascorbic

acid. The inhibition by (II) and (in part) that by (III) is due to preferential production of hippuric acid (V). Methods of determining  $\text{BzOH}$ ,  $\text{NH}_2\text{Bz}$ , and (V) in biological material are described. W. McC.

**Cholesterase.** S. UTZINO and S. TSUNOO (Z. physiol. Chem., 1937, 249, 181—182).—Rabbits' blood, liver and kidney of ox and rabbit, and ox spleen contain an enzyme, cholesterase, which hydrolyses the Na salt of cholesteryl H phthalate, exhibiting optimal activity at  $p_{\text{H}}$  7—8.

W. McC.

**Plant phenolases.** R. M. SAMISCH (Plant Physiol., 1937, 12, 499—508).—All plant extracts examined oxidised > one phenol, but exhibited preferential action. Ortho-phenolase from avocado and apricot fruit oxidises pyrocatechol rapidly and pyrogallol more slowly and was inactivated at relatively low temp. Meta-phenolase from lemon leaves oxidised phloroglucinol rapidly and resorcinol very slowly and was more resistant to heat. Para-phenolase of pear leaf oxidised quinol and was heat-stable.  $p_{\text{H}}$ -activity curves and Michaelis consts. for these enzymes are recorded. Glucosides contain phenols corresponding with the phenolase systems occurring with them in plants. Oxidised forms of phenols are reduced by ascorbic acid in all cases.

A. G. P.

**Polyphenolases.** E. YAKUSHIJI (Acta Phytochim., 1937, 10, 63—80).—The prep. is described of a polyphenolase (I) from *Lactarius piperatus* by fractional pptn. with  $\text{COMe}$ , and  $(\text{NH}_4)_2\text{SO}_4$ . The optimal  $p_{\text{H}}$  for its activity varies with the substrate. On reduction with  $\text{Na}_2\text{S}_2\text{O}_4$ , (I) gives a haemochromogen band at 550—560  $\text{m}\mu$ . (I) requires the presence of a free OH or  $\text{NH}_2$  group and, with PhOH derivatives, a side-chain in the *o*-position. A pyrocatechol-oxidase (II) is also prepared from *Octaviania columellifera* the activity of which is sp. to the *o*-OH-polyphenols. KCN inhibits (I) and, to a greater extent, (II), whilst CO inhibits (II) but not (I); the inhibition is not abolished by light irradiation.  $\text{NH}_2$ -acids accelerate the action of both (I) and (II) by combining with the quinones arising by oxidation of the phenols.

P. W. C.

**Catalytic oxidation of cytochrome-c by various polyphenolases, metal-complex salts, and pyridine-haemin.** T. MORI, K. OKUNUKI, and E. YAKUSHIJI (Acta Phytochim., 1937, 10, 81—112).—The polyphenolase of *L. piperatus* (cf. preceding abstract), various Co and Ni complex salts (e.g.,  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ ), and  $\text{C}_5\text{H}_5\text{N}$ -haemin catalytically oxidise reduced cytochrome-c (I). Other complex salts and the pyrocatechol oxidases of *O. columellifera* and potato do not oxidise  $p\text{-C}_6\text{H}_4(\text{NH}_2)_2$  and are without action on the oxidation of (I).

P. W. C.

**Synthetic action of lipase in adipose tissue.** G. QUAGLIARIELLO and F. CEDRANGOLO (Enzymologia, 1937, 4, Part II, 73—75).—The lipase of fatty tissue (dog, ox) effects esterification of glycerol or BuOH with oleic acid but not with AcOH.

F. O. H.

**Specificity of choline-esterase.** L. H. EASSON and E. STEDMAN (Biochem. J., 1937, 31, 1723—1729).—Choline-esterase of serum (guinea-pig, horse) is sp. for choline esters and does not attack  $\text{PrCO}_2\text{Me}$ , but

is almost certainly responsible for the slight effect of human serum on tributyrin. P. G. M.

**Electrometric determination of choline-esterase activity of blood. Activity in pulmonary tuberculosis.** G. SCOZ and C. CATTANEO (*Enzymologia*, 1937, 4, Part II, 157—162).—The choline-esterase (I) activity (determined by electrometric titration of hydrolysis of acetylcholine) of blood is diminished in tuberculosis. In normal and diseased men, and also after administration of atropine or adrenaline, the (I) content of the blood is parallel to the arterial blood pressure. F. O. H.

**Method of the Italian Pharmacopœia of determining peptic activity.** E. ROVIDA (*Boll. Chim. farm.*, 1937, 76, 500, 503).—The I.P. V method is compared with those of other Pharmacopœias and modifications are suggested. F. O. H.

**Enzymes of blood-serum. II. Amylase content of human serum. III. Esterase contents in tuberculous patients.** N. SUGIYAMA (*Sci-i-Kwai Med. J.*, 1935, 54, 1531—1538).—II. In males the amylase content is max. at 50—59 and min. at 40—49 years of age. In females the max. occurs at 13—19 and min. at 50 years.

III. The esterase index in tuberculosis is 82% < normal and decreases with increasing severity of the disease. CH. ABS. (p)

**Distribution of various enzymes in intermediate regions of animals with certain blood-vessels and organs excluded by anastomosis. I. Amylase.** E. S. LONDON and N. KOTSCHNEV (*Enzymologia*, 1937, 4, Part II, 239—241).—In dogs with exclusion of intestine, liver, salivary glands, spleen, kidney, and muscle, no change occurs in the serum-amylase level. Injected amylase is selectively absorbed by the organs in the order liver > kidney > salivary gland > muscle > spleen. F. O. H.

**Enzymic histochemistry. XXIII. Distribution of amylase in the outer layers of the barley grain.** K. LINDERSTRÖM-LANG and C. ENGEL (*Enzymologia*, 1937, 3, 138—146).—The aleurone cells are poor in amylase but the boundary layer between these and the starch cells is rich, containing 15% of the total present in the grain. Previous to germination  $\beta$ -amylase alone is present, and only 1/3 of that present is active. Subsequently the total amylase increases, the active proportion remaining about the same, whilst some  $\alpha$ -amylase also appears in the boundary layer. R. M. M. O.

**[Plant-]amylases.** M. BOLLI (*Atti R. Accad. Lincei*, 1937, [vi], 25, 519—524).—Aq. amylase extracts from germinating seeds exhibit a specificity of varying degree with starches from the same family of plants but are inactive with those of other families. Amylolytic action by embryos grown on filter-paper moistened with H<sub>2</sub>O or 0.2% aq. H<sub>2</sub>C<sub>2</sub>O<sub>4</sub> or by caryopses grown on gelatin media indicates that the variation in specificity is at least partly due to differences in acidity of the media. The *in-vivo* activity of amylases is discussed. F. O. H.

**Activation of malt amylase by shaking.** O. HOLMBERGH (*Svensk Kem. Tidskr.*, 1937, 49, 252—

255).—Aq. solutions of amylase (I) are inactivated by shaking with PhMe or CHCl<sub>3</sub>. This is inhibited by the products of reaction of (I) on starch, but is unaffected by the addition of maltose. In presence of EtOH  $\alpha$ -(I) is inhibited less rapidly than  $\beta$ -(I), thus providing a method for the purification of  $\alpha$ -(I).

M. H. M. A.

**$\beta$ -Amylase from ungerminated barley.** K. MYRBACK and B. ÖRTENBLAD (*Biochem. Z.*, 1937, 293, 107—117).—The extraction of amylase, its instability in EtOH, salting out with MgSO<sub>4</sub>, pptn. with HgCl<sub>2</sub>, adsorption on Al<sub>2</sub>O<sub>3</sub>, ZnO, and kaolin, and subsequent elution and dialysis of its solutions are investigated. Considerable inactivation occurs in most of these processes. P. W. C.

**Enzymic hydrolysis of trimethylcarbinol- $\beta$ -*D*-glucoside.** S. VEIBEL (*Enzymologia*, 1937, 3, 147—152).—The rate of this hydrolysis is very slow in comparison with that of methyl- $\beta$ -*D*-glucoside, but computation of the rates of dissociation of the hypothetical enzyme-substrate complex into free enzyme and products of the reaction gives consts. showing far less difference, viz.,  $0.05 \times 10^{-2}$  and  $2.93 \times 10^{-2}$ . R. M. M. O.

**Specificity of glucosidases. I. Behaviour of  $\beta$ -*D*-glucosidases of different sources with  $\beta$ -*D*-glucosides with varying aglucones.** T. MIWA, C. T. CHENG, M. FUJISAKI, and A. TOISHI (*Acta Phytochim.*, 1937, 10, 155—170).—The behaviour of  $\beta$ -glucosidase (I) preps. from 15 different sources (plant, mould) against  $\beta$ -glucosides (II) having 4 different aglucones (PhOH, saligenin, *o*- and *p*-cresol) is determined and a table summarises their relative activities. The seeds of species of *Prunus* contain large amounts of (I) and the enzyme preps. from them have about the same activity, the (II) of *o*-cresol being hydrolysed most quickly and of *p*-cresol most slowly. The enzyme preps. of seeds of other phanerogams are less active and vary more amongst themselves. The enzyme preps. from various moulds (all ascomycetes) are powerfully active but the (II) of saligenin and *o*-cresol are hydrolysed less rapidly than that of PhOH (*i.e.*, reverse of *Prunus* results). P. W. C.

**Kinetics of catalysed sugar hydrolysis as a function of temperature.** I. W. SIZER (*J. Cell. Comp. Physiol.*, 1937, 10, 61—77).—During the log phase of the reaction the crit. increment for the catalysis of sucrose (I) inversion by yeast invertase (II) has a const. val. of 12,000 over the temp. range 4—45°. It is independent of changes from 3.2 to 7.9 and of (I) or enzyme concn., and is unaltered by the presence of various electrolytes. The same val. is found for inversion of raffinose by (II); this supports the view that the crit. increment is characteristic of the catalyst and not of the reaction. For (I) inversion by malt invertase the crit. increment is 13,000. Since the course of the inversion and the temp. of heat-inactivation are different from those for (II), it is probable that the two invertases are chemically distinct. M. A. B.

**Detection and characterisation of isodynamic pyrophosphatases.** E. BAMANN and H. GALL

(Biochem. Z., 1937, 293, 1—15).—In animal organs there exist three isodynamic pyrophosphatases which, with  $\text{Na}_4\text{P}_2\text{O}_7$  as substrate, have  $p_{\text{H}}$  optima respectively at 3.9—4.2, 5.2—6.0, and 7.6—8.3. Methods are described for their separation from one another and from phosphatase by selective inactivation.

P. W. C.

**Co-enzymes.** H. VON EULER (Angew. Chem., 1937, 50, 831—836).—A lecture.

**Cozymase.** H. VON EULER (Ergebn. Physiol., 1936, 38, 1—30).—A review.

W. McC.

**Action of phosphorus oxychloride on cozymase.** F. SCHLENK (Naturwiss., 1937, 25, 668).—Co-dehydrogenase-I is converted on treatment with  $\text{POCl}_3$  in dry  $\text{Et}_2\text{O}$  into a product which dehydrogenates hexose monophosphate and is probably identical with codehydrogenase-II.

P. W. C.

**Phosphomonoesterase.** Y. OHMORI (Enzymologia, 1937, 4, Part II, 217—231).—The enzyme (I) is determined in blood and tissues by methods based on hydrolysis of *p*-nitrophenyl (colorimetric) or hexyl phosphate (stalagmometric). The three types of (I) (from pig's kidney, yeast, and rice-bran) have  $p_{\text{H}}$  optima at 3.2, 5.6, and 9.0, respectively, and occur in rabbit's erythrocytes and organs.

F. O. H.

**Phosphatases and phosphatases of milk.** A. CONTARDI, C. RAVAZZONI, and L. OSELLA (Enzymologia, 1937, 3, 170—179).—A phosphatase action with optimum  $p_{\text{H}}$  2.5 was demonstrated in samples of milk from several groups of cows. It is intensified by lactose, galactose, and  $\text{HCN}$ , but not by the oxidation system present in an extract of orange pips. Ascorbic acid destroys this action, an acidic phosphatase becoming active in its place.

R. M. M. O.

**Action of phosphatases of green leaves on formaldehyde monophosphate.** P. PRATESI (Enzymologia, 1937, 4, Part II, 242—245).—The phosphatases of optimum  $p_{\text{H}}$  5.0 and 8.0 preferentially hydrolyse  $\beta$ - and  $\alpha$ -glycerophosphate, respectively; they differ also in their action on hexose diphosphate. The possibility of phosphates participating in the photochemical formation of sugars in plants is discussed. Polyoxymethylene with  $\text{H}_3\text{PO}_4$  in sealed tubes at 140—145° affords *Ca formaldehyde monophosphate*, probably  $\text{OH}\cdot\text{CH}_2\cdot\text{O}\cdot\text{CaPO}_3$ .

F. O. H.

**I. Presence of phosphatases in green leaves.**

**II. Specificity of phosphatases of green leaves.** P. PRATESI (Annali Chim. Appl., 1937, 27, 309—321, 321—328).—I. The fresh leaves of 16 plants examined contained phosphatases (I) which hydrolyse  $\text{Na } \beta$ -glycerophosphate and, to a smaller extent,  $\text{Na}$  sucrose phosphate. The optimum  $p_{\text{H}}$  varies from 4.2 to 6.7 with the different preps. whilst the inhibitory action of  $\text{NaF}$  is also dependent on  $p_{\text{H}}$ .

II. At  $p_{\text{H}}$  4.7, preps. of (I) hydrolyse  $\beta$ - more readily than  $\alpha$ -glycerophosphoric acid (II). The hydrolysis of 3-phosphoglyceric acid (with formation of glyceric acid) indicates (I) to be phosphoesterases. Preps. of (I) exhibit no optical specificity in the hydrolysis of (II).

F. O. H.

**Manometric determination of fermentation and equivalent carbonic acid in two-buffer systems.** H. DIECKMANN and H. MOHR (Biochem. Z., 1937, 292, 332—349).—Theoretical considerations of determinations in buffer systems of, e.g.,  $\text{PO}_4'''$ — $\text{CO}_2$ — $\text{HCO}_2'$  are given and a suitable type of apparatus is described.

F. O. H.

**Aspartase activity of yeast.** H. HAEHN and H. LEOPOLD (Biochem. Z., 1937, 292, 380—387).—Autolysates of bottom yeast hydrolyse *L*-aspartic acid at  $p_{\text{H}}$  8.0 with formation of fumaric acid but have no action on glutamic acid, glycine, alanine, and leucine.

F. O. H.

**Phosphorus exchange in yeast.** G. HEVESY, K. LINDERSTRÖM-LANG, and N. NIELSEN (Nature, 1937, 140, 725).—Analyses of yeast grown in solutions containing radioactive P as Na phosphate show that no exchange of P atoms takes place between the yeast and the culture solution.

L. S. T.

**Effect of a water-soluble carcinogenic substance on metabolism of yeast carbohydrates.** Y. POURBAIX (Compt. rend. Soc. Biol., 1937, 126, 92—94).—"Styryl 430" inhibits yeast respiration and glycolysis and increases the incubation period of zymase.

H. G. R.

**Chemical processes during cell division. III. Inhibition and re-establishment of cell division.** L. RAPKINE (J. Chim. phys., 1937, 34, 416—427; cf. A., 1936, 1291).—At  $p_{\text{H}}$  4.4—7.24, the inhibition by 0.001M- $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  (I) of fermentation by *Schizosaccharomyces Pombe* becomes more marked with time, but the rate at which (I) penetrates the cells decreases as the  $p_{\text{H}}$  rises (cf. A., 1932, 1065). Reduced glutathione (II), but not cysteine or thioglucose, gradually restores to the yeast the power of cell division inhibited by long contact with 0.0003M-(I). It is suggested that the (I) penetrates the cell, combines with  $\cdot\text{SH}$  groups, making them inactive, and the (II) has a sp. effect in restoring the  $\cdot\text{SH}$  content. The rate of inhibition by 0.0005M-I of yeast-cell division and the rate of restoration of cell division by (II) is  $>$  in the case of (I) (cf. A., 1933, 865).

J. G. A. G.

**Two types of spore germination: genetic segregations in *Saccharomyces* demonstrated through single spore cultures.** Ö. WINGE and O. LAUSTEN (Compt. rend. Lab. Carlsberg, 1937, 22, 99—116).—Technique for the isolation and cultivation of the four spores in an ascus of *Saccharomyces ellipsoideus* and for the germination of the spores in two different ways is described.

H. G. R.

**Role of glutathione in the metabolism of yeast.** S. MACHLIS and K. C. BLANCHARD (J. Cell. Compt. Physiol., 1937, 9, 207—216).—Respiration and aerobic fermentation in yeast are not affected by addition of reduced glutathione (I) or cysteine. There is a correlation between (I) content of the cells and the ratio of the quantities of glucose utilised by respiration and aerobic fermentation. The ratio of reduced to total (I) in the cell is not altered by destruction of a large proportion of reduced (I) by  $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$  or I. Intracellular oxidation and reduc-

tion of (I) is reversible. A second oxidation-reduction system maintains most of (I) in the reduced state.  
M. A. B.

**Mechanism of carbohydrate dissimilation in bakers' yeast.** T. J. B. STIER and J. N. STANNARD (J. Cell. Comp. Physiol., 1937, 10, 79—92).—Measurement of the rates of endogenous respiration of yeast over the temp. range 4° to 27° showed a R.Q. of 1 at all temp., both for the phase of const. rate and the phase of first order decline. The crit. increment was 16,000 for both phases. The mechanisms involved are discussed in the light of the above results.  
M. A. B.

**Chemical constitution of "cerebrin" of beer yeast.** E. RUPPOL (Bull. Soc. Chim. biol., 1937, 19, 1164—1172).—The formula  $C_{42}H_{85}O_5N$  attributed by Reindel (A., 1930, 920) to cerebrin should be  $C_{46}H_{91}O_4N$ . On hydrolysis it gives a OH-acid,  $C_{23}H_{56}O_3$  (a homologue of cerebronic acid), and sphingosine,  $C_{18}H_{37}O_2N$ . Reindel's substance of m.p. 83—84° is probably methylsphingosine.  
P. W. C.

**Velocity of sedimentation of yeast.** N. NIELSEN (Compt. rend. Trav. Lab. Carlsberg, 1937, 22, 61—87).—A method is described for the determination of sedimentation velocity ( $v$ ). Concordant results are obtained under specified conditions, but a statement of the time of sedimentation must be made.  $v$  is much affected by cultural conditions, being great in solutions poor in growth factors but small in, e.g., beer wort, which is rich in such factors.  $v$  with  $NH_2$ -acids or peptone as source of N is significantly  $>$  with  $(NH_4)_2SO_4$ , but the [N] is of little importance.  $v$  falls somewhat with increasing age of yeast cells and also with increasing temp. of cultivation.  $p_H$  is of little significance. The vals. of  $v$  for a no. of yeasts and yeast-like organisms are compared.  
I. A. P.

**Measurement of the growth of yeast from changes of  $p_H$  in the culture medium.** V. HARTELIUS (Compt. rend. Trav. Lab. Carlsberg, 1937, 22, 89—98).—The method of Boas (Angew. Bot., 1936, 18, 351) for determination of yeast growth in presence of varying concns. of growth factor (log wt. of yeast dry substance  $+ p_H = \text{const.}$ ) appears to be valid only within certain limits, e.g., with 2— $\frac{1}{3}$ % of wort added to mineral nutrient solutions containing sugar; with concns.  $< \frac{1}{8}$ % very large errors appear. Dry wt. of yeast is here used instead of the original cell count, but the ratio cell count : dry wt. is reasonably const.  
I. A. P.

**Influence of alkaloids on the fermentative power and multiplication of yeast.** C. ENDERS and F. M. WIENINGER (Biochem. Z., 1937, 293, 22—29).—Investigation of the stimulatory (at low concn.) and inhibitory (at higher concn.) action of quinine, papaverine, caffeine, cinchonine, and pilocarpine on the growth of yeast for 24 and 48 hr. shows that the toxicity of these alkaloids (reckoned in terms of a 25% inhibition) decreases in the order given. At higher concns., the fermentative power is inhibited to the same extent as the multiplication.  
P. W. C.

**Mechanism of cellular death through high pressure. Modifications accompanying death in yeast.** B. LUYET (Compt. rend., 1937, 204, 1506—1508).—Pressure influences both permeability and coagulation. Staining with methylene-blue is taken as index of death; this occurs in 20% of cells exposed to 4800 atm. for 2 min. and in 75% with 6000 atm. The cytological effects are described. The smallest cells are killed selectively; their cell membranes show no structural disintegration. Sudden release of pressure has no special effects.  
R. M. M. O.

**Fungicides. I. Influence of hydrogen-ion concentration on the growth of yeast-like organisms. II. *In vitro* tests with chemicals on yeast-like organisms and other fungi.** H. C. HESSELTINE and W. J. NOONAN (J. Lab. Clin. Med., 1935, 21, 281—287).—I. Pathogenic fungi isolated from vaginal and oral mycoses show optimum growth at  $p_H$  5.5 but in many cases were active at  $p_H$  7.0—7.5. Fungistatic action occurred at  $p_H < 4.0$  and  $> 7.5$ .

II. No universal fungicide is suitable for clinical use since closely related yeast-like organisms vary in susceptibility. Data for a no. of fungicides are given.  
CH. ABS. (p)

**Detection of hydrogen sulphide production by micro-organisms.** M. FELDMAN and C. A. HUNTER (Proc. S. Dakota Acad. Sci., 1935, 15, 41—45).—Suitable culture media are described.  
CH. ABS. (p)

**Preparation of fat by micro-organisms.**—See B., 1937, 1232.

**Representation of biochemical and epidemiological reactions by Pearson's curve IV.** DUFRENOY and VEZIAN (Rev. Microbiol. Appl., 1937, 3, 135—143).—Five instances are given of experimental distributions, relating to mould biochemistry and bacterial infections, which are shown to conform to this type of curve.  
L. D. G.

**Absorption of organic acids by fungi.** J. FOURNIER and D. BACH (Bull. Sci. Pharmacol., 1937, 44, 353—366).—Absorption of  $H_2C_2O_4$ , lactic acid, and AcOH by *Aspergillus niger*, *A. repens*, etc. at different  $p_H$  indicates that org. acids penetrate the cell as neutral mols. or electrically neutral complexes.  $\gamma$  and fat solubility also play a part. When penetration is rapid, the cellular buffer system is destroyed and death follows. This action may be modified by protective mechanisms.  
E. M. W.

**Production of polyhydroxyanthraquinones by moulds.** H. RAISTRICK (Enzymologia, 1937, 4, Part II, 76—78).—Emodin Me<sub>1</sub> ether from *Aspergillus ruber* is identical with physcion from the lichen *Xanthoria parietina*, L. (cf. A., 1937, II, 107).  
F. O. H.

**Mechanism of enzyme action. XV. Enzymic transformations by *Fusarium lini*, Bolley, and *Fusarium oxysporum*.** F. F. NORD, H. HOFSTETTER, and E. DAMMANN (Biochem. Z., 1937, 293, 231—255; cf. A., 1937, III, 66).—*F. oxysporum* has a more powerful dehydrogenase system than, but otherwise does not differ in biochemical behaviour

from, *F. lini*. Phosphorylation of sugar by living *F. lini* ceases after a definite proportion of the inorg.  $\text{PO}_4'''$  present has been transferred, is independent of changes in concn. of substrate or  $\text{PO}_4'''$ , and is not affected by addition of adenosinephosphoric acid (I) or PhMe. It is probable that under optimal conditions complete consumption of inorg.  $\text{PO}_4'''$  or complete phosphorylation of substrate does not occur but equilibrium between free (inorg.)  $\text{PO}_4'''$  and bound (org.)  $\text{PO}_4$  is attained. Fresh *F. lini* contains 0.4 mg. of (I) per 100 g. and fresh *F. oxysporum* the same concn. of adenosinetriphosphoric acid (II). The growth of the fungi is promoted by adding (I) or (II) to the medium, the (I) and (II) contents of the fungi being greatly (up to 30-fold) increased. Phosphorylations at  $p_{\text{H}}$  4–7 do not proceed more rapidly with the enriched than with the non-enriched fungi.

W. McC.

**Enzymic decomposition by *Fusaria*.** Effect of adenylic and adenosinetriphosphoric acid on the living cell during alcoholic fermentation and dehydrogenation by *Fusaria*. F. F. NORD, H. HOFSTETTER, and E. DAMMANN (Naturwiss., 1937, 25, 652).—With fermentation by *Fusaria* at  $p_{\text{H}}$  4–7, addition of adenylic acid (I) or adenosinetriphosphoric acid (0.2M) increases the activity of the mycelium to an extent not proportional to the increase in available (I). At  $p_{\text{H}}$  3.5, the addition of (I) doubles the production of  $\text{CO}_2$  with formation of org. phosphoric esters at the expense of (I). This phenomenon occurs not only when carbohydrates (glucose and arabinose) are fermented but also when alcohol is dehydrogenated. The effect is most marked after a P deficiency of the cells lasting 4–6 days. Under anaerobic conditions, the activity of the cells and particularly the dephosphorylation of (I) are inhibited.

W. O. K.

**Action of degradation products of aneurin on *Phycomyces*.** Second growth-factor of *Mucoraceae*. W. H. SCHOPFER and A. JUNG (Compt. rend., 1937, 204, 1500–1501).—Aneurin (I) enables the organism to synthesise its own growth-factors. Activity in (I) preps. not accounted for by their (I) content is perhaps related to the products of heat-inactivation. The two fission products of (I) are inactive alone but in appropriate mixture have the same activity as a corresponding amount of (I). (I) is probably not utilised as such but only after splitting of the mol.

R. M. M. O.

**Origin of spiral growth in *Phycomyces*.** E. S. CASTLE (J. Cell. Comp. Physiol., 1936, 8, 493–502).—Spiral growth probably is due to interaction between turgor and elastic forces in the chitin membrane of the cell, and not to the structure of the chitin mol.

M. A. B.

**Longevity of sclerotia of certain fungi under controlled environmental factors.** Y. NISIKADO and K. HIRATA (Ber. Ohara Inst. Landw. Forsch., 1937, 7, 535–547).—The viability of sclerotia of *Sclerotinia* and *Hypochnus* species immersed in  $\text{H}_2\text{O}$  was similar to that when pre-soaked in 10% NaCl and > that when stored in the air-dry condition.

A. G. P.

**Effect of one organism on the parasitic activity of another.** R. S. VASUDEVA (J. Indian Bot. Soc., 1935, 14, 71–83).—Activity of *Botrytis cinerea* is lowered by the presence of other organisms or of the staled substrate of other organisms or in aq. extracts of their spores, but is accelerated by aq. extracts of its own spores or those of *B. allii*. The latter and *Penicillium* species diminish the activity of internal and external enzymes of *B. cinerea* when grown in mixed cultures but not when the enzymes are prepared from separate cultures. CH. ABS. (p)

**Microchemical colorimetric  $p_{\text{H}}$  procedure for differentiating the telia of *Cronartium ribicola* and *C. occidentale*.** R. J. ACREE and W. H. GOSS (J. Agric. Res., 1937, 55, 347–352).—Leaves bearing the telia are treated with 0.1N-HCl and washed. Telia are removed with a scalpel to a slide and treated with bromophenol-blue at  $p_{\text{H}}$  7.6. *C. ribicola* is stained blue and *C. occidentale* green.

A. G. P.

**Effects of salts on emergence from the cyst in protozoa.** K. V. THIMANN and A. J. HAAGEN-SMIT (Nature, 1937, 140, 645–646).—In *Colpoda cucullus*, excystment is produced by the Na and K salts of oxalic, succinic, acetic, fumaric, tartaric, and citric acids. The salts and not the free acids are active, K and Na salts being approx. of equal activity. Activity decreases with increasing mol. wt., heptioic and azelaic acids forming the upper limits in their series. It is markedly increased by a  $\beta$ -OH. A mixture of carbohydrates and  $\text{PO}_4'''$  imitates the  $\text{Et}_2\text{O}$ -insol. residue in increasing the activity of these salts. Some of the salts themselves increase the apparent activity of the others.

L. S. T.

**Effect of silicon on growth and respiration in *Chilomonas paramecium*.** S. O. MAST and D. M. PACE (J. Cell. Comp. Physiol., 1937, 10, 1–13).—Si increases rates of growth and respiration in *C. paramecium* mainly by catalysing the synthesis of complex org. compounds.

M. A. B.

**Action of fluorescent dyes on paramecia as affected by  $p_{\text{H}}$ .** L. V. BECK and A. C. NICHOLS (J. Cell. Comp. Physiol., 1937, 10, 123–132).—Basic (cyanine and acridine) dyes are, in general, more toxic in the dark and have a stronger photodynamic action at  $p_{\text{H}}$  7.4 than at 6.2. The reverse is true for acid (fluorescein) dyes.

M. A. B.

**Effect of some chemotherapeutics on metabolism of trypanosomes in reference to interference phenomena.** G. SCHEFF and A. HASSKÓ (Zentr. Bakt. Par., 1936, I, 136, 420–424).—Parafuchsin (I), trypanflavin (II), and neosalvarsan (III) depress the  $\text{O}_2$  and sugar consumption of flagellates, diminution of sugar decomp. being observed before changes in respiration. Na thioglycollate and (I) protect the organism against the influence of (II) and (III). Accumulation of dyes and their therapeutic action are not identical processes. Chemotherapeutics incapacitate the  $\text{CN}'$ -insensitive  $\text{H}_2$ -carrier system of the trypanosomes.

A. G. P.

**Insoluble ferrocyanides and putrefaction of organic matter.** L. PILATI (Boll. Chim. farm., 1937, 76, 471–473).— $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$  in presence of

putrefying meat for some months yields small amounts of CN'.

F. O. H.

**Bacteriochlorophyll a.** H. FISCHER and R. LAMBRECHT (Z. physiol. Chem., 1937, 249, I—III; cf. A., 1935, 362, 1270; 1937, III, 122).—The formulæ for bacteriomethylphæophorbide *a* (I), bacteriochlorin Me<sub>3</sub> ester (II), and bacteriopurpurin Me<sub>8</sub> ester are C<sub>36</sub>H<sub>10</sub>O<sub>6</sub>N<sub>4</sub>, C<sub>37</sub>H<sub>14</sub>O<sub>7</sub>N<sub>4</sub>, and C<sub>37</sub>H<sub>12</sub>O<sub>8</sub>N<sub>4</sub>, respectively. (I) with H<sub>2</sub>SO<sub>4</sub> and O<sub>2</sub> followed by esterification with CH<sub>3</sub>N<sub>2</sub> gives 2-acetylmethylphæophorbide identical with the *b*-component obtained from bacteriophæophytin by the action of HCl in MeOH. Similarly (II) gives 2-acetylchlorin Me<sub>3</sub> ester. Bacteriochlorophyll derivatives and acetylchlorophyll derivatives of the *a* series are attacked by chlorophyllase and hence their structures are similar to that of chlorophyll. (I) and (II) on dehydrogenation with Cu(OAc)<sub>2</sub> and AcOH consume 0.61 and 0.52 mol. of O<sub>2</sub>, respectively.

W. McC.

**Physiology of Azotobacter. I. Respiration of *A. chroococcum* with special reference to N<sub>2</sub> assimilation and CO inhibition.** H. KUBO (Acta Phytochim., 1937, 10, 219—238).—AcOH, PrCO<sub>2</sub>H, and hexoic and octoic acids are oxidised by *A. chroococcum*. The respiration is not completely inhibited by 0.001M-KCN, and some other respiration system in addition to cytochrome must be present. EtOH and Bu<sup>n</sup>OH are utilised for respiratory purposes and the presence of dehydrogenase systems for MeCHO and EtOH are detected by the methylene-blue technique. NH<sub>2</sub>OH and NH<sub>4</sub> salts inhibit N<sub>2</sub> assimilation but NH<sub>4</sub> salts permit growth and increased O<sub>2</sub> utilisation. Respiration in a N<sub>2</sub>-free atm. in presence of mannitol is greatly decreased on adding NH<sub>2</sub>OH. The bearing of the results on the mechanism of respiration is discussed.

P. W. C.

**Prevention of assimilation in respiring cells.** C. E. CLIFTON (Enzymologia, 1937, 4, Part II, 246—253).—With the oxidation (to CO<sub>2</sub>, CH<sub>2</sub>O, and H<sub>2</sub>O) of OAc' and PrCO<sub>2</sub>' by suspensions of *Pseudomonas calco-acetica*, Beijerinck, in PO<sub>4</sub><sup>'''</sup> buffer, assimilatory processes are inhibited and oxidation of the substrate is completely effected by CH<sub>2</sub>I·CO<sub>2</sub>H, NaN<sub>3</sub>, 2:4-dinitrophenol, or NH<sub>2</sub>·CO<sub>2</sub>Me. The effects of these poisons on respiration and synthesis indicate a close relationship between the two processes. Similar phenomena occur with *Bacterium coli* and *Spirillum serpens*. The analogy of the results with those of mammalian tissue respiration is discussed.

F. O. H.

**Fluorescence of photosynthesising cells.** D. VERMEULEN, E. C. WASSINK, and G. H. REMAN (Enzymologia, 1937, 4, Part II, 254—268).—The fluorescence spectra (apparatus described) of living photosynthesising unicellular organisms (green alga *Chlorella* and purple S bacterium *Chromatium*) are independent of λ of the incident light. With both organisms, the max. val. of absorption of the green pigments is closely related to the spectral distribution of the fluorescent light. The fluorescent light-energy is 0.15 and 0.005%, respectively, of the incident energy; when the absorbed light is expressed in quanta, the yield of fluorescence is independent

of those spectral regions where only chlorophyll and bacteriochlorophyll, respectively, absorb light.

F. O. H.

**Aerobic oxidation of carbohydrates by luminous bacteria: inhibition of oxidation by certain sugars.** F. H. JOHNSON (J. Cell. Comp. Physiol., 1936, 8, 439—463).—Numerous carbohydrates and carbohydrate alcohols were tested as substrates for *Vibrio phosphorescens* and *Achromobacter fischeri* and the influence of concn. on rate of oxidation was studied. Only compounds with 3 or 6 C were oxidised. *A. fischeri* oxidised only reducing compounds, with the exception of glycerol (I) and melezitose. In all cases acid was produced by the O<sub>2</sub> oxidation. The rate of oxidation of glucose was not increased by fructose, mannose, galactose, or (I). In some cases non-oxidisable compounds inhibited the oxidation of other compounds of similar configuration, probably by competitive action for the adsorptive surfaces. Those compounds which were most readily oxidised were most effective in maintaining luminescence, and inhibition of oxidation inhibited maintenance of luminescence.

M. A. B.

**Hexose oxidation by luminous bacteria. I. Effect of some natural and synthetic glucosides and related substances.** F. H. JOHNSON (J. Cell. Comp. Physiol., 1937, 9, 199—206).—Oxidation of hexoses is stimulated or retarded by certain glucosides which do not affect endogenous respiration. A given glucoside may increase or decrease O<sub>2</sub> consumption according to the hexose substrate used. Methylglucosides have a much greater effect than oligosaccharides. Luminescence is not markedly increased by any of the substances, but is decreased by phloroglucinol and kojic acid.

M. A. B.

**Osmotic and surface properties of marine luminous bacteria.** F. H. JOHNSON and E. N. HARVEY (J. Cell. Comp. Physiol., 1937, 9, 363—380).—Transference of the bacteria from sea-H<sub>2</sub>O to distilled H<sub>2</sub>O causes cracking of the cell membrane and loss of cell contents, luminescence, and motility and the suspension becomes foamy. The cells do not dissolve completely, but the suspension becomes clearer and the bacteria more difficult to centrifuge. These latter changes, which result from changes in the salt-sensitive colloidal outer layer of the cells, can be reversed by adding traces of Ca or Mg, whereas foaming and cessation of luminescence and motility which are due to loss of cell contents cannot be reversed.

M. A. B.

**Rate of carbon dioxide assimilation by purple bacteria at various wave-lengths of light.** C. S. FRENCH (J. Gen. Physiol., 1937, 21, 71—87).—The rate of assimilation of CO<sub>2</sub> by the photosynthetic bacterium *Spirillum rubrum* when irradiated by light of different λ is at a max. at λ = 590 and 880 mμ. These correspond with the absorption max. in the spectrum of the bacteriochlorophyll; hence this and not the carotenoids (absorption max. 490, 510, and 550) acts as a light-absorber for CO<sub>2</sub> reduction.

E. M. W.

**Metabolism of purple bacteria. III. Presence of a hydrogenlyase in *Rhodobacillus palustris* and its role in the mechanism of bacterial**

**photosynthesis.** H. NAKAMURA (Acta Phytochim., 1937, 10, 211—218; cf. A., 1937, III, 356).—*R. palustris* in the dark and  $N_2$  forms  $H_2$  and  $CO_2$  from formate and from glucose, the  $Q_{10}$  vals. being 100 and 30 and the  $H_2:CO_2$  ratios 1.07 and 10, respectively. When, however, the cultures are kept in the light, the  $H_2$  formation from formate becomes only 5% whilst that from glucose is 81% of that in the dark. Formate does not but butyrate and glucose do act as H donors for reduction of methylene-blue. The meaning of the results in terms of the hydrogenase and hydrogenlyase contents of the cells and of bacterial photosynthesis is discussed.  
P. W. C.

**Nutritive value of pentosans. VIII. Xylan-decomposing bacteria.** H. IWATA (J. Agric. Chem. Soc. Japan, 1937, 13, 978—988).—Very active, new species of bacteria have been isolated from the cæcum and rumen which decompose xylan (I) into xylose and small amounts of lactic acid and  $AcOH$ ,  $HCO_2H$ , and  $CO_2$ . They hydrolyse starch, dextrin, inulin, melezitose, raffinose, trehalose, melibiose, lactose, sucrose, maltose, and salicin. The optimum  $pH$  is 6.8—7.4 at 37°. They are harmless to rats and mice, and probably are necessary for higher animals on diets containing (I).  
J. N. A.

**Growth-factors for bacteria. VI. Fractionation and properties of an accessory factor for lactic acid bacteria.** E. E. SNELL, F. M. STRONG, and W. H. PETERSON (Biochem. J., 1937, 31, 1789—1799; cf. A., 1937, III, 316).—The growth of various lactic acid bacteria, grown in media containing acid-hydrolysed peptone, glucose,  $NaOAc$ , cystine, tryptophan, riboflavin, and inorg. salts, is promoted by the addition of a factor (I) present in an  $EtOH$ -sol. liver extract. Preps. of (I) are sol. in  $Et_2O$ , unstable to heat and alkali, somewhat labile to mild treatment with  $Br$  or  $HNO_3$ , and active in concns. of  $0.3 \times 10^{-6}\%$ ; (I) appears to be distinct from any of the known plant or bacterial growth-factors.  
W. O. K.

**Metabolism of the strict anaerobes (*Clostridium*). VI. Hydrogen production and amino-acid utilisation by *C. tetanomorphum*.** D. D. WOODS and C. E. CLIFTON (Biochem. J., 1937, 31, 1774—1788).—*C. tetanomorphum* grown anaerobically on a tryptic digest medium produces  $H_2$  and  $CO_2$ . Washed suspensions of the bacteria decompose *l*-glutamic acid, *dl*-serine, and *L*-aspartic acid, -histidine, -cysteine, -tyrosine, and -methionine with formation of  $H_2$ ,  $CO_2$ , and  $NH_3$ . Cystine is also attacked, but only traces of  $H_2$  are evolved. Pyruvate, fumarate, *l*-malate, *d*-glucose, *d*-maltose, and glycerol are also decomposed with evolution of  $H_2$  and  $CO_2$ .  
W. O. K.

**Colon group of [bacteria from] fish.** Y. YASUKAWA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 151—178).—Characteristics and reactions of *B. coli* isolated from intestinal tracts of fish and from human faeces are compared.  
J. N. A.

**Influence of photodynamic substances on the ability of *Bact. coli* to ferment lactose.** G. GUERRINI (Zentr. Bakt. Par., 1936, I, 136, 241—243).—Eosin, fluorescein, and æsculin inhibit lactose fermentation at higher and have a stimulatory effect

at lower concns. Crit. concns. differ for various strains of *B. coli*. Me-violet at all concns. examined had a stimulative action.  
A. G. P.

**Urea metabolism in relation to terrestrial dynamics.** E. CASTELLANI (Riv. Biol., 1937, 23, 50—62).—Soil bacteria with appropriate nutrition cause an increase in sol. and replaceable Ca of the soil. With degradation of added urea, the Ca decreases owing to its replacement by  $NH_4^+$ ,  $CaCO_3$  being formed. The part played by the colloidal and ionic constituents of the soil is discussed.  
F. O. H.

**Bactericidal action of *B. mesentericus* filtrates on the diphtheria bacillus.** P. WEILAND (Zentr. Bakt. Par., 1936, I, 136, 451—456).—A filterable, heat-resistant substance having a sp. bactericidal action on the diphtheria bacillus diffuses from cultures of *B. mesentericus* into the culture medium.  
A. G. P.

**Immuno-chemistry. II. Isolation and properties of a specific antigenic substance from *B. dysenteriae*, Shiga.** W. T. J. MORGAN (Biochem. J., 1937, 31, 2003—2021; cf. A., 1936, 898).—A method is described for the isolation of certain bacterial antigens by extraction with various solvents, e.g., ethylene, diethylene, and trimethylene glycols, glycerol, at neutral reaction and at normal or low temp. The sp. antigen of the "smooth" form of *B. dysenteriae*, thus isolated, is free from protein, does not exceed 6—7% of the original wt. of the mass of organisms, is not destroyed by trypsin at  $pH$  8.5, and is readily hydrolysed by dil. acid to give 48% of its wt. of the sp. polysaccharide,  $[\alpha] +98^\circ$ ,  $N$  1.8%, and 28% of material ( $N$  7.1,  $P$  0.8%) insol. in  $H_2O$ . The antigenic material induces an antibacterial immunity response which is qualitatively identical with that produced by the sp. antigen of the intact micro-organisms.  
P. W. C.

**Function of hæmin as growth-factor for *Hæmophilus influenzae*.** A. LWOFF and M. LWOFF (Compt. rend., 1937, 204, 1510—1512).—Limiting dilution of hæmin (I) for peptone-yeast extract media is represented by an addition of 1 in  $4-5 \times 10^6$  of blood. Organisms isolated from cultures show an  $O_2$  uptake which is increased 200—400% by such addition of (I), but diminishes after 1—2 hr.  
R. M. M. O.

**Physiology of respiration of bacteria. III. Oxidation of various phenols and phenylenediamines by *Bacillus pyocyaneus*.** S. YAMAGUTCHI (Acta Phytochim., 1937, 10, 171—198; cf. A., 1936, 1422).—The increase in  $O_2$  absorption by cultures of *B. pyocyaneus* on addition of 14 phenols, diamines, etc. is greatest with  $p-C_6H_4(NH_2)_2$  (I) and decreases in the order (I) > tyrosine (II) > quinol (III) > pyrocatechol (IV) > *o*- (V) and  $p-NH_2-C_6H_4-OH$  (VI) > resorcinol (VII), pyrogallol (VIII) > *o*- (IX) and  $m-C_6H_4(NH_2)_2$ ,  $m-NH_2-C_6H_4-OH$ , phloroglucinol, *o*-, *m*-, and *p*-cresol. Heating the bacilli at 52° for 90 min. before addition of PhOH did not decrease this  $O_2$  absorption with (I), (III), and (VI) but led to a reduction by >70% with (IV), (VII), (VIII), (V), (II), phenylalanine, alanine, and lactic and succinic acids. The  $O_2$  absorption is also inhibited by >70% by 0.001M-KCN with (I), (III), (VI), and

(II), but is either not or <30% inhibited with (IV), (VII), (VIII), and (V). The prep. is described of a cell-free enzyme extract which readily oxidises (I), (III), and (VI), less readily (IV), (IX), and (V), less readily still (VIII), and does not attack the remaining substances. The oxidation by this enzyme extract of (I), (III), and (VI) is considerably inhibited by 0.001M-KCN. The extract oxidises cytochrome-c. The results are discussed in respect of the mechanism of bacterial oxidations. P. W. C.

**Improved medium for demonstration of hydrolysis of sodium hippurate by *Streptococci*.** J. M. COFFEY and G. E. FOLEY (Amer. J. Publ. Health, 1937, 27, 972—974).—The medium contains pepsin 0.5, CaCl<sub>2</sub> 0.003, Na hippurate 1, and asparagine 0.1% instead of peptone 1%. J. N. A.

**Polysaccharides produced by *Bacterium typhi flavum*.** I. MALEK (Compt. rend. Soc. Biol., 1937, 126, 127—130).—The chemical and serological reactions of polysaccharide fractions obtained with EtOH are discussed. H. G. R.

**Importance of  $\beta$ -receptors for the life of bacteria.** K. AOKI (Z. Immunitats., 1937, 91, 153—156).—After subculturing on PhOH-agar or Endo agar about 30 times typhoid bacilli lost both  $\alpha$ -receptors, while the  $\beta$ -receptors were unchanged. Types of oriental hog cholera, paratyphoid B, and typhoid bacilli which agglutinated only with difficulty retain both the  $\alpha$ - and the  $\beta$ -receptors. C. R. S.

**Nucleic acid of proteins of *Vibrio cholerae* and related organisms.** B. N. MITRA (Indian J. Med. Res., 1936, 24, 1—4).—Nucleic acid is extracted from the proteins by treatment with 1% NaOH at 37°. It contains cytosine and uracil, but no thymine. R. N. C.

**Absorption spectra of the proteins of *Vibrio cholerae* and related organisms.** B. N. MITRA (Indian J. Med. Res., 1936, 24, 5—12).—The type I pseudoglobulins give identical absorption curves, as do the type II pseudoglobulins, but the two curves differ considerably from each other. The differences become more pronounced in the course of incubation with 0.05N-NaOH at 37°, the max. in the type I curve, initially at 270 m $\mu$ ., tending to move up the scale, whilst the position of the max. in the type II curve varies irregularly. R. N. C.

***Vibrio* polysaccharides.** R. W. LINTON and B. N. MITRA (Indian J. Med. Res., 1936, 24, 323—330).—Arabinose (I) is identified in presence of glucose and galactose in hydrolysates of *Vibrio* polysaccharides (II) by isolation of hexosazones from a portion of the hydrolysate and destruction of the hexoses in the remainder by fermentation with yeast, which does not affect (I). Growth of the organisms on agar does not cause contamination of (II) by the medium. All three types of (II) exist in the cells as Ac derivatives, which are hydrolysed during extraction of (II) with alkali. The Ac and deacetyl forms of each type of (II) differ from each other and from the corresponding forms of the other types, in  $[\alpha]_D$ . All contain about 3% of N and 0.6% of NH<sub>2</sub>-N. Type I can be extracted completely from the cell as its Ac derivative, but in the other types a

considerable amount requires deacetylation before it can be extracted. R. N. C.

**Agglutination in the vibrios. I. Effect of heat on chemical structure and surface potential. II. Effect of salt and sera.** R. W. LINTON, B. N. MITRA, and S. C. SEAL (Indian J. Med. Res., 1936, 24, 19—35, 331—348).—I. The total amount of polysaccharide (I) in vibrios is unchanged by heating in buffer solution at  $p_H$  7.0, or in 0.9% NaCl, but the (I) tends to pass into the supernatant fluid. The "A" fraction (see A., 1935, 761) of the solid material also tends to pass into solution, but neither its composition nor that of the "B" fraction is appreciably altered; the residue fraction, however, shows a fall in total N and NH<sub>2</sub>-N, and an increase in humin-N, indicating a progressive mild hydrolysis. The supernatant fluid shows a sharp rise in NH<sub>2</sub>-N and a progressive increase of AcOH-precipitable substances, largely (I) and protein hydrolysis products; EtOH-precipitable substances and free sugars also show increases. The appearance of NH<sub>2</sub>-N in the supernatant fluid is correlated with a rise in the surface potential. These effects are all concerned in bringing about the destruction of the "H" antigen.

II. Variable concns. of NaCl affect the surface potentials of vibrios according to the general principles governing colloidal flocculations. The potential falls with increasing [NaCl], without causing agglutination as the cohesive force is also depressed. Individual strains vary as regards potential, but cataphoresis fails to differentiate the chemical groups. R. N. C.

**Effect of sodium chloride on the phage-bacterium reaction.** E. J. SCRIBNER and A. P. KRUEGER (J. Gen. Physiol., 1937, 21, 1—16).—The presence of 0.25M-NaCl during the reaction between a susceptible staphylococcus and its homologous phage has no effect on bacterial growth, rate of phage production, or phage distribution up to the point of lysis, but delays lysis by approx. 0.7 hr. During the delay, phage concn. increases 5—10 times but measurements of turbidity and O<sub>2</sub> consumption indicate that there is no bacterial growth. E. M. W.

**Inhibition of individual types of cholera bacteriophage by *Vibrio* extracts.** C. G. PANDIT and N. M. MAITRA (Indian J. Med. Res., 1936, 24, 13—18).—The extracts when classified according to their phage type inhibitions fall into three groups, which are generally similar to the groups obtained by Linton *et al.* according to the respective polysaccharides of the strains (cf. A., 1936, 761). R. N. C.

**Thermostability of vaccine virus.** V. D. TIMAKOV and M. N. DODONOV (Vestn. Mikrobiol., 1937, 15, 301—306).—Sugar and albuminous vaccines are more stable at 37° than glycerinated or dry ones and are recommended for human vaccination. W. O. K.

**$p_H$  stability range of the elementary bodies of vaccinia.** J. W. BEARD, H. FINKELSTEIN, and R. W. G. WYCKOFF (Science, 1937, 86, 331—332).—The activity of the vaccine virus is preserved for < a week at  $p_H$  5—9.5; inactivation proceeds rapidly

at  $p_H$  4 and 10.5, and is practically instantaneous at  $p_H < 3$  and  $> 11.5$ . Pure elementary bodies of vaccinia were obtained after several passages of the virus in rabbit skin; the sedimentation const. is approx.  $5 \times 10^{-10}$  cm. per sec. per dyne. Infectivity tests and ultracentrifugal analysis show that solutions or suspensions of the elementary bodies are stable probably only in very dil. salt solutions; the homogeneity of suspensions in 0.1M-neutral buffer rapidly disappears. Decomp. at  $p_H$  11.8 gives much unsedimentable material and a substance with a sedimentation const. of approx.  $19 \times 10^{-11}$ , one third that of the active elementary bodies. The sedimentation const. of the bodies is unaltered by  $p_H$  in the region where the activity is unaffected. L. S. T.

**Virus of tobacco-mosaic. X. Activity and yield of virus-protein from plants diseased for different periods.** W. M. STANLEY (J. Biol. Chem., 1937, 121, 205—217; cf. A., 1937, III, 228).—Virus-protein (I) in inoculated leaves of Turkish tobacco plants increases more than  $10^6$ -fold in 4 days, the rate of increase being greatest during the first 3 weeks and the max. content being attained in 5 weeks. The total N content of extracts of infected plants remains approx. const. for long periods but the protein-N content increases to a max. and then decreases. As the amount of (I) increases the amount of protein of low mol. wt. decreases. The activity of (I) increases when the period of infection is increased from one to two weeks but not when it is increased from 2 to 13 weeks. W. McC.

**Artificially-prepared visible paracrystalline fibres of tobacco mosaic virus nucleoprotein.** R. J. BEST (Nature, 1937, 140, 547—548).—Fibres prepared from solutions of the pure virus-protein by suitable adjustment of  $p_H$  and salt and virus concns. have the same dimensions and properties as those formed spontaneously (A., 1937, III, 228). The presence of nucleic acid in the virus mol. has been confirmed. L. S. T.

(A) **Molecular sedimentation constants of tobacco-mosaic virus-proteins extracted from plants at intervals after inoculation.** R. W. G. WYCKOFF. (B) **Ultracentrifugal isolation of latent mosaic virus-protein.** H. S. LORING and R. W. G. WYCKOFF (J. Biol. Chem., 1937, 121, 219—224, 225—230; cf. A., 1937, III, 100).—(A) In the plants the protein (I) consists of one mol. species only having sedimentation const.  $174 \times 10^{-13}$  cm. sec.<sup>-1</sup> dynes.<sup>-1</sup> The susceptibility of (I) to the action of salts  $[PO_4]^{'''}$ ,  $(NH_4)_2SO_4$  increases with age (2—13 weeks). An approx. const. amount of a second species of protein having sedimentation const.  $200 \times 10^{-13}$  cm. sec.<sup>-1</sup> dynes.<sup>-1</sup> occurs in 2—3-week samples.

(B) The average yields of (I) of mol. wt. approx.  $9 \times 10^6$  from 100 c.c. of the juice of infected Turkish *Nicotiana tabacum* and *N. glutinosa* are 4.9 and 10.5 mg., respectively. The concn. of (I) in the juice is of the order of 0.01 g. per 100 c.c., 99.9% being isolated by ultracentrifuging, which produces 1000- to 10,000-fold increase in the (I) concn. The sedimentation const. of (I) is  $113 \times 10^{-13}$  cm. sec.<sup>-1</sup> dynes.<sup>-1</sup>.

It is usually accompanied by a heavier protein having sedimentation const.  $131 \times 10^{-13}$  cm. sec.<sup>-1</sup> dynes.<sup>-1</sup> W. McC.

**Physiology of plant viruses.** H. M. FRANKE (Biochem. Z., 1937, 293, 39—63).—Determination by the quinhydrone electrode of the anaerobic potential in leaf press-juice or tissue-pulp does not give comparable results but the disturbing substances can be removed by centrifuging and the potential determined in 0.5 c.c. of centrifugate. With *Nicotiana tabacum*, the  $p_H$  for individual leaves of the same plant did not differ greatly but of different plants differed by as much as 0.9, the old yellow leaves being more acidic and the young shoots more alkaline. Plants infected with virus show considerable alkalosis, increased buffering, and a changed titration curve. A variety of plants was similarly investigated.

P. W. C.  
**Lysozyme.** E. GILDEMEISTER (Zentr. Bakt. Par., 1936, I, 136, 408—412).—The mol. size of lysozyme is < that of bacteriophage. A. G. P.

**Some thermostable bacteriolysins and the lysozyme question.** P. SPANIER (Rev. Microbiol. Appl., 1937, 3, 67—72).—A general discussion.

L. D. G.  
**Nucleolytic nature of lysozyme.** P. SPANIER and D. DERIBAS (Rev. Microbiol. Appl., 1937, 3, 61—66).—Ovalbumin and human tears both show the presence of an active nucleotidase. The bacteriolytic properties of lysozyme preps. are attributed to this enzyme. L. D. G.

**Hydrolase content of certain bacteria.** G. VERCELLANA (Zentr. Bakt. Par., 1936, I, 136, 225—230).—In numerous species of bacteria examined no enzymes absolutely identical with trypsin, cathepsin, amylase, or lipase from animal sources could be identified. A. G. P.

**Oligodynamic action of silver with special reference to silver halides.** S. IKEDA (Zentr. Bakt. Par., 1936, I, 136, 269—278).—Ag plates activated by oxidants have a bactericidal action > that of plates activated by HCl. Among electrolytically activated plates those prepared with  $NaCrO_4$  were the most effective; those activated in KI or KCN exhibited marked inhibitory properties in media free from protein and  $Cl'$ . The oligodynamic action of Ag is not dependent on  $p_H$ . In agar substrates diffusion of  $Ag'$  from activated plates is recorded. In Cohn's solution the bactericidal action of  $Ag_2CrO_4$  is > that of  $AgCl$ ; that of  $AgBr$  and  $AgI$  is markedly weaker. On the basis of equal  $[Ag']$  the relative toxicity of the salts is  $Br' > I' > Cl' > CN'$ . The presence of  $Br'$  inhibits the action of  $AgBr$  > that of  $AgCl$  and  $Cl'$  inhibits the effect of  $AgCl$  > that of  $AgBr$ . Org. matter inhibits the action of dissolved Ag salts. A. G. P.

**Antiseptic properties of alkyl dimethylbenzylammonium chloride.** P. G. HEINEMAN (J. Amer. Pharm. Assoc., 1937, 26, 711—717).—The compound (in which the alkyl group is a mixture of  $C_{8-18}H_{17-27}$  derived from coconut oil) has a high  $PhOH$  coeff. (up to 318 in  $H_2O$  and 154 in serum) when tested against various micro-organisms, and readily destroys

spores of *Bacillus subtilis* and of two types of fungi. It has a disinfecting, but non-irritating, action on the human skin. F. O. H.

**Effect of vitamin-C and its organo-metallic complexes on the development and the fermenting power of *B. coli*.** F. ARLOING, A. MOREL, A. JOSSERAND, L. THÉVENOT, and R. CAILLE (Compt. rend. Soc. Biol., 1937, 126, 5—7).—Development of *B. coli* is diminished but the fermenting power increased by the addition of ascorbic acid (I), dehydro-ascorbic acid (II), or their complexes. The activity of Fe, Pb, and Ti complexes of (I) or (II) is < that of the Na salts, whereas Cu complexes inhibit growth completely. H. G. R.

**Bacteriostatic action of *p*-aminobenzenesulphonamide on hæmolytic streptococci.** H. FINKLESTONE-SAYLISS, C. G. PAINE, and L. B. PATRICK (Lancet, 1937, 233, 792—795).—The bacteriostatic action of *p*-NH<sub>2</sub>·C<sub>6</sub>H<sub>4</sub>·SO<sub>2</sub>·NH<sub>2</sub> (I) on hæmolytic streptococci is preceded by a phase of growth stimulation which is more pronounced in young cultures than in cultures that have passed through the logarithmic phase of growth. (I) is more sol. in the fatty envelope that can be separated from hæmolytic streptococci than in aq. solution. It does not appear to modify the activities of polymorphonuclear leucocytes. (I) stimulates the phagocytic activity of reticulo-endothelial cells of rabbits, and the production of polymorphonuclear leucocytes by the bone-marrow. L. S. T.

**Disinfectants of the urinary passage. I. Influence of hydrogen ions on the degradation of various drugs, especially arbutin. II. Additive complexes of urotropine and dihydric phenols.** B. CACCIAVILLANI (Boll. Soc. ital. Biol. sperim., 1937, 12, 277—278, 278—280).—I. The efficacy and dependence on *p*<sub>H</sub> of urinary antiseptics are discussed. Arbutin (I) is only slowly hydrolysed at *p*<sub>H</sub> < 1 and > 11 and hence is useless as an antiseptic.

II. The additive compounds of (CH<sub>2</sub>)<sub>6</sub>N<sub>4</sub> with (I), resorcinol, and pyrocatechol (1:1, 1:1, and 1:2 mols., respectively) have properties suggesting their unsuitability as urinary antiseptics. F. O. H.

**Skim-milk agar for routine milk counts.** C. E. SAFFORD and C. N. STARK (J. Dairy Sci., 1937, 20, 577—582).—Tryptone-glucose-skim-milk agar containing 0.5 and 2.0% of skim-milk gave counts 180 and 215% higher, respectively, than standard agar for pasteurised milk. The 2% skim-milk agar further possesses differential val. for bacterial types which applies for the examination of other dairy products and for starters. W. L. D.

**Simple tellurite-chocolate-agar medium for typing and isolation of *Corynebacterium diphtheriae*.** G. A. W. NEILL (J. Hyg., 1937, 37, 552—560).—A simple peptone broth-laked blood-mixture-K tellurite-agar medium is described. W. L. D.

**Pipettes for bacteriological investigations.** A. PASVEER (Chem. Weekblad, 1937, 34, 619).—The markings on 2-c.c. pipettes graduated in 0.1-c.c. divisions, as used for measuring samples of milk, are made by fusing short lengths of blue glass rods

on the outside of the instrument. The method used for fixing the strips is described. S. C.

**Response of the skin blood vessels to hormones.** W. SPRINGORUM (Pflüger's Archiv, 1936, 238, 353—360).—Adrenaline produces constriction of the blood vessels in the skin; histamine and acetylcholine cause dilatation. M. A. B.

**Inactivation of adrenaline.** H. BLASCHKO, D. RICHTER, and H. SCHLOSSMANN (J. Physiol., 1937, 90, 1—17).—Rat-liver slices accelerate the inactivation of adrenaline (I) in presence of O<sub>2</sub>. (I) increases the O<sub>2</sub> uptake of extracts of liver, kidney, and intestines of rats, guinea-pigs, and rabbits. CN' does not completely inhibit (I) oxidation by the extracts, one atom of O being taken up per mol. of (I); this oxidation is inhibited by narcotics, but not by CO or glutathione. The inactivating system is non-dialysable and thermolabile. It contains an oxidising substance which is neither carbohydrate nor protein, and also an inhibitor of autoxidation, which is not effective above *p*<sub>H</sub> 8.0. The rate of oxidation of *l*-(I) is double that of *d*-(I). R. N. C.

**Seasonal variations in the sensitivity of the muscular arteries of *Rana temporaria* to adrenaline.** F. KARASEK and O. POUPA (Compt. rend. Soc. Biol., 1937, 126, 113—116).—Variations in the sensitivity of the arteries to adrenaline during spawning are attributed to changes in the concn. of the sex hormones in the blood. H. G. R.

**Atrophy of the adrenal cortex of the rat produced by the administration of large amounts of cortin.** D. J. INGLE and E. C. KENDALL (Science, 1937, 86, 245).—This effect is prevented by the simultaneous administration of a fraction of anterior pituitary extract which has high adrenotropic activity. L. S. T.

**Aggravation of pancreatic diabetes by anterior pituitary extract.** V. G. FOGLIA, R. GERSCHMAN, A. D. MARENZI, J. M. MUNOZ, and C. T. RIETTI (Compt. rend. Soc. Biol., 1937, 126, 152—153).—The symptoms are intensified by the extract, but insulin decreases the intensity of the effect. H. G. R.

**Pituitary humoral regulator of protein depots in the liver.** T. Y. LIANG and S. W. WU (Chinese J. Physiol., 1937, 12, 125—137).—Extracts of anterior pituitary gland contain a substance (I) which is identical with that in the blood of fasting dogs or cats, and causes complete disappearance of the liver-protein when injected into rats. (I) is not identical with any other hormones prepared from the gland, is sol. in H<sub>2</sub>O, insol. in EtOH, CHCl<sub>3</sub>, and CMe<sub>2</sub>, thermolabile, and unstable to 0.1N-HCl and -NaOH, and is adsorbed on Fe(OH), but not on C or kaolin. J. N. A.

**Internal secretions and milk production.** F. HOGREVE (Z. Züchtung, 1937, B, 35, 299—378).—Published work on the relationship of lactation and endocrine glands is reviewed. Administration of various pituitary and follicular hormone preps. did not affect production of milk or milk-fat by lactating goats and cows. Growth of the lacteal glands and secretion of milk (up to 1 litre per day), however, can

be induced in virgin goats, whilst the development of lacteal glands and secretion of milk in a male goat receiving hormone treatment are recorded.

F. O. H.

**Test for prolactin based on films of the mucous membrane of the crop.** J. R. VALLE (Compt. rend. Soc. Biol., 1937, 126, 134—136).—The films are examined for the appearance of fat staining with Sudan III.

H. G. R.

**Effects of the thyrotropic hormone of the anterior pituitary in man.** E. F. SCOWEN (Lancet, 1937, 233, 799—802).—Thyrotropic hormone prepared from the anterior pituitary gland of the pig increased the metabolic rate in man in health and in cases of pituitary insufficiency, but is without effect in myxœdema. Hence the thyroid gland in man is under the control of the anterior pituitary gland, and in the absence of stimulation from the pituitary, thyroid function ceases, and variations in the amount of stimulation by the thyrotropic hormone regulate the degree of thyroid activity.

L. S. T.

**Effect of gonadotropic hormone on the degradation of histidine in the liver.** R. KAPELLER-ADLER and G. BOXER (Biochem. Z., 1937, 293, 207—218; cf. A., 1935, 1525).—The power of human (male and female) liver pulp to decompose histidine (I) is almost halved by addition of < 20 rat units of gonadotropic hormone (II). The extent of the reduction is not affected by varying the amount of (II) from 50 to 500 rat units or by inactivating it (e.g., with  $\text{H}_2\text{SO}_4$ ). The action of partly purified histidase from liver on (I) is only occasionally inhibited by (II). Material obtained from the urine of non-pregnant women in the same way as (II) is produced from that of pregnant women has no effect on the power of liver to decompose (I).

W. MCC.

**Gonadotropic activity of amphibian anterior pituitary.** H. ZWARENSTEIN (Nature, 1937, 140, 588).—Implantation of the anterior pituitary from *Xenopus laevis* into immature white mice produced ovarian, uterine, and vaginal responses showing that the gonadotropic substance of amphibian anterior pituitary can activate the mammalian reproductive apparatus.

L. S. T.

**Absorption and excretion of œstrone by the human organism.** T. KEMP and K. PEDERSON-BJERGAARD (Lancet, 1937, 233, 842—845).—3—12% of œstrin (I) administered to men or to castrate women is soon excreted in the urine; the proportion excreted is greater after oral than after parenteral administration. (I) is very rapidly absorbed and excreted in the former case and has therefore a comparatively low sp. biological action.

L. S. T.

**Effect of litter size on growth and of œstrone administered during lactation (of rat).** A. M. HAIN (Quart. J. Exp. Physiol., 1935, 25, 303—313).—Injection of œstrone in lactating rats did not induce œstrus but prolonged the diœstrus interval. Large dosages caused abnormal development in the urogenital region in suckling and in new-born females.

CH. ABS. (p)

**Degradation of folliculin in cold-blooded animals.** P. ENGEL and E. NAVRATIL (Biochem. Z., 1937, 292, 434—437).—Frog's liver-pulp destroys > 75% of added folliculin (I) whilst muscle-pulp is without action. Perfusion of (I) solution through the (dead) frog's liver does not produce inactivation whilst (I) injected into the lymph sac of normal or hepatectomised living frogs is destroyed to the extent of > 93% in 48 hr.

F. O. H.

**Origin of folliculin and gonadotropic hormones.** L. CATTANEO (Riv. Biol., 1937, 23, 14—19).—Perfusion of human, surviving placenta with Locke-Ringer's solution in presence of  $\text{O}_2$  results in the production *de novo* of folliculin and gonadotropic hormones A and B.

F. O. H.

**Action of folliculin and anterior pituitary extracts on gastric secretion.** G. DE LISI (Riv. Biol., 1937, 23, 23—32).—Experiments with normal and thyroidectomised dogs indicate that folliculin (I) stimulates gastric secretion directly and also indirectly by acting on the thyroid glands. Anterior pituitary extract also stimulates directly, an indirect or delayed effect being due, not to its action on the thyroid, but to its ability to cause hypersecretion of (I).

F. O. H.

**Synthesis of folliculin in the organism of females with avitaminosis-A.** B. A. KUDRJASCHOV (Bull. soc. nat. Moscou, Sect. biol., 1935, 44, 45—56).—Avitaminotic rats produced much folliculin when the ovaries were stimulated with prolan (I). No vitamin-A appeared in the livers of these animals. Massive injections of (I) produced a prolonged and interrupted œstrus.

CH. ABS. (p)

**Effect of progestin on the growth response of the uterus to chronic distention.** S. R. M. REYNOLDS and W. M. ALLEN (Anat. Rec., 1937, 68, 481—488).

R. N. C.

**Effect of prolan on the calcium balance in frogs.** L. DI BELLA (Boll. Soc. ital. Biol. sperim., 1937, 12, 386—387).—The elimination of Ca by frogs is increased by injection of prolan to an extent approx.  $\propto$  the amount injected.

F. O. H.

**Influence of the spleen and various glands of internal secretion on experimental hypercalcaemia.** S. RILOLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 293—294).—The hypercalcaemia due to injection of Ca gluconate into rabbits is not significantly affected by removal of the spleen, adrenals, ovaries, or testes.

F. O. H.

**Blood-sugar and -cholesterol of splenectomised and castrated animals treated respectively with testicular and splenic extracts.** A. LIGAS (Boll. Soc. ital. Biol. sperim., 1937, 12, 301—303).—Splenectomy or castration in rabbits increases the blood-sugar and -cholesterol. The levels in normal rabbits are unaffected by testicular extracts but are diminished by splenic extracts. The (increased) levels in splenectomised rabbits are unaffected by testicular extracts whilst those in castrated rabbits are diminished (i.e., tend towards normal vals.) by splenic extracts.

F. O. H.

Active principles of the male generative glands. H. DANNENBAUM (Ergebn. Physiol., 1936, 38, 796—835).—A review. W. McC.

Genesis of the testicular hormone. Biochemical transformation of  $\Delta^5$ -androstenedione into *iso*androstanediol and  $\Delta^4$ -testosterone. L. MAMOLI and A. VERCELLONE (Ber., 1937, 70, [B], 2079—2082; cf. A., 1937, III, 199).—Addition of  $\Delta^5$ -androstenedione in EtOH to a fermenting mixture of sucrose and top yeast affords *iso*androstanediol, m.p. 163—164°,  $[\alpha]_D^{25} +4.3^\circ$ , with small amounts of  $\Delta^4$ -testosterone. The unexpected hydrogenation of the double linking is ascribed to its presence in the  $\beta$  position to CO. H. W.

Augmentation of the vascular effect of adrenaline by testosterone. F. KARASEK and O. POUPA (Compt. rend. Soc. Biol., 1937, 126, 116—118). H. G. R.

Modification of the vascular effect of adrenaline by sex hormones of the opposite sex. F. KARASEK and O. POUPA (Compt. rend. Soc. Biol., 1937, 126, 118—119).—The augmentation of the action of adrenaline by the sex hormones is sp. for the sex. H. G. R.

Rapid test for the male hormone. Mitosis in the accessory genitalia of castrated male rats. T. MARTINS (Compt. rend. Soc. Biol., 1937, 126, 131—134).—Colchicine is injected 14 hr. after injection of the male hormone and karyokinesis can be observed in the seminal vesicles and prostate. H. G. R.

Transformation of male sex hormones into a substance with the action of a female hormone. E. STEINACH and H. KUN (Lancet, 1937, 233, 845).—Administration of testosterone propionate or androsterone benzoate to men results in the excretion in the urine of increasing amounts of oestrogenic substance. L. S. T.

Inhibition of menstruation and ovulation by means of testosterone propionate. S. ZUCKERMAN (Lancet, 1937, 233, 676—680).—Adequate amounts of testosterone propionate inhibit menstruation in normal mature rhesus monkeys for an indefinite period. No injury results to the internal reproductive organs. Follicular growth and luteinisation are both inhibited. L. S. T.

Effect of enol-esters of testosterone. K. MIESCHER, W. H. FISCHER, and E. TSCHOPP (Nature, 1937, 140, 726—727).—The effect of the di-esters on the capon's comb is, in general, less intense but more prolonged than that of the mono-esters. With a 10-day injection test on the rat, the effect of the enol-esters on the seminal vesicles is < that of testosterone propionate; the longer is the chain of the acid groups the less is the effect. When the temporal course of a single injection is considered, however, the activity of the diacetate is between that of the monoacetate and the propionate; the remaining enol-esters exert a more extensive influence. Testosterone 3-acetate 17-butyrate exhibits the most prolonged effects of the known compounds of the male sex hormone series. L. S. T.

Benzanthracene derivatives.—See A., II, 497.

Conversion from the androstane to the pregnane series.—See A., II, 505.

Oestrogenic substance from the demethylation of anethole.—See A., II, 495.

New compounds of the follicle hormone series.—See A., II, 505.

Corticosterone.—See A., II, 506.

Enolic derivatives of progesterone etc.—See A., II, 505.

Insulin. V. DU VIGNEAUD (J. Washington Acad. Sci., 1937, 27, 365—373).—An account of the author's work on the form in which S occurs in insulin. F. O. H.

Effect of various hormones on blood-glutathione. II. Insulin and vagotonin. E. ZUNZ and O. VESSELOVSKY (Biochem. Z., 1937, 292, 326—331; cf. A., 1933, 321, 1087).—The contents of reduced and oxidised glutathione (I) in the erythrocytes of dogs are not changed by injection of cryst. insulin; those of reduced and total (I) are increased by intravenous injection of vagotonin into dogs with or without ligature of the adrenal vein. F. O. H.

Hypoglycaemic action of insulin-tannic acid. F. M. CHIANCONE (Boll. Soc. ital. Biol. sperim., 1937, 12, 323—324).—In rabbits the hypoglycaemic action of insulin (I) (3 clinical units) is reduced in intensity but is prolonged by injection in presence of 0.6 c.c. of 6% aq. tannic acid. The effect of Zn (1 mg. of ZnSO<sub>4</sub>) added to the mixture is intermediate between the above and that (increased but not prolonged hypoglycaemia) of Zn+(I) alone. F. O. H.

Clinical experience with protamine insulinate. H. F. ROOT, P. WHITE, A. MARBLE, and E. H. STOTZ (J. Amer. Med. Assoc., 1936, 106, 180—183).—The compound is not indefinitely stable and is relatively slowly absorbed. CH. ABS. (p)

Production of fibromatous growths by parathyroid injections. H. BIBERSTEIN (Arch. Dermatol. Siphilis, 1935, 173, 253—261).—Intramuscular injection of parathyroid extracts in guinea-pigs and rabbits produced changes of a fibromatous nature. Tissue sections showed negative Kossa tests for Ca. CH. ABS. (p)

Thyroid function and carbohydrate metabolism. F. VACIRCA (Arch. Ist. Biochim. Ital., 1937, 9, 225—256).—Intravenous injection of lecithin into rabbits, dogs, or guinea-pigs reduces the liver-glycogen and the hyperglycaemia due to injection of glucose or adrenaline. These effects do not occur after thyroidectomy. F. O. H.

Relations between thyroid gland, blood-sugar, and storage of glycogen. C. SCHWARZ [with A. BOHRN and A. MAYER] (Biochem. Z., 1937, 293, 295—301).—In thyroidectomised dogs oral administration of large doses of glucose (I) causes an increase in the sugar content of the blood which is almost double that produced by the same doses in normal dogs, the effect being also more prolonged in the thyroidectomised dogs. In thyroidectomised (but not in normal) dogs the hyperglycaemic effect of (I) is diminished by previous administration of thyroid.

Possibly the thyroid gland directly or indirectly affects the storage of carbohydrate in the body. W. McC.

**Hyperthyroidism and brain oxidations.** R. A. COHEN and R. W. GERARD (J. Cell. Comp. Physiol., 223—240).—O<sub>2</sub> consumption is higher initially in hyperthyroid than in normal brain and is increased to a greater extent than that of normal brain by addition of glycogen, glucose, fructose, glycerophosphate, lactate, or succinate. Pyruvate, galactose, glycine, and AcCHO have the same effect in hyperthyroid as in normal brain. Hyperthyroid brain contains higher concns. of various enzyme systems than does normal brain and dehydrogenases are increased relatively > oxidases. M. A. B.

**Nature of the hormone controlling Brunner's glands.** H. W. FLOREY (Quart. J. Exp. Physiol., 1935, 25, 329—339).—Brunner's glands in cats are controlled by secretin. CH. ABS. (*p*)

**Number of neurohormones in the control of frog melanophores.** G. H. PARKER and L. E. SCATTERY (J. Cell. Comp. Physiol., 1937, 9, 297—314).—Only one hormone, probably intermedin (I), appears to be involved in the control of frog melanophores. Darkening results from liberation of (I) into the blood stream; blanching is due to loss of (I) from the blood. M. A. B.

**Relationship between vagotonin, callicrein, and vagotropine.** B. BRUNO (Boll. Soc. ital. Biol. sperim., 1937, 12, 306—307; cf. Bartolini, A., 1936, 1293).—Vagotropine is not identical with callicrein or vagotonin. F. O. H.

**Vitamin nomenclature.** C. FUNK (Z. Vitaminforsch., 1937, 6, 337—339).—The premature introduction of chemical nomenclature for vitamins is deprecated. F. O. H.

**Vitamin therapy in non-avitaminotic conditions.** J. CHARVAT (Z. Vitaminforsch., 1937, 6, 339—348).—The use of vitamin preps. in certain diseases is discussed and clinical data are given. F. O. H.

**Vitamins required by chicks.** T. H. JUKES (J. Nutrition, 1937, 13, 359—387).—A review of recent work. A. G. P.

**Effect of cod-liver oil on the iron and copper contents of egg yolk.** S. E. ERIKSON and W. M. INSKO, jun. (Kentucky Agric. Exp. Sta., 46th Ann. Rept., 1934, 53—55).—Feeding cod-liver oil to hens increased the yield and Cu and Fe contents of the eggs. Free grass range and sunshine with or without oil had a similar effect. Birds on grass range without cod-liver oil showed lower haemoglobin (I) contents in the blood than did similar birds receiving oil. (I) tended to decrease when egg production was high. The Fe content of liver, spleen, and kidney of penned birds was higher when oil was given. On grass range oil-feeding produced higher Fe contents in liver but not in spleen or kidneys. CH. ABS. (*p*)

**Correlation between the international and the cod-liver oil unit of vitamin-A.** Z. NAKAMIYA (Bull. Inst. Phys. Chem. Res. Japan, 1937, 16, 1149—1158).—1 Lovibond unit = 256 international units. More consistent development of the SbCl<sub>3</sub> colour

occurs after hydrolysis of the oil probably because of the removal of colour inhibitors. J. L. D.

**Foetal death, prolonged gestation, and difficult parturition in the rat as a result of vitamin-A deficiency.** K. E. MASON (Amer. J. Anat., 1935, 57, 303—344).—Reproductive disturbances resulting from maternal deficiencies of vitamin-A are examined. CH. ABS. (*p*)

**Undernutrition, starvation, and phagocytosis.** E. GELLHORN and J. O. DUNN (J. Nutrition, 1937, 14, 145—153).—The decrease in phagocytic index due to prolonged deficiency of vitamin-A (see following abstract) is due to lack of -A and not to loss of body-wt. A. G. P.

**Effect of lack of vitamin-A in the diet on phagocytosis-promoting properties of blood-serum.** E. GELLHORN and J. O. DUNN (J. Nutrition, 1937, 13, 317—328).—Vitamin-A deficiency may increase or decrease the phagocytic index. Infectious processes occurring in -A deficiency induce greater production of antibodies in the early stages of deficiency. Subsequently the phagocytic index gradually diminishes. Addition of -A to the diet causes reversal of the change in the index. A. G. P.

**Minimum vitamin-A and carotene requirement of cattle, sheep, and swine.** H. R. GUILBERT, R. F. MILLER, and E. H. HUGHES (J. Nutrition, 1937, 13, 543—564).—The amount of -A which just prevents night blindness in these animals is also the physiological min. The min. carotene and -A requirements for all species were 25—30 and 6—8 × 10<sup>-6</sup> g. per kg. body-wt., respectively. The -A requirement is directly related to body-wt. rather than to the energy requirement. A. G. P.

**Vitamin-A activity of butters determined by various methods.** M. E. LEUSCHEN, B. L. KUNERTH, M. M. KRAMER, and W. H. RIDDELL (J. Nutrition, 1937, 14, 247—259).—Data obtained by the SbCl<sub>3</sub> and spectrographic methods for vitamin-A and the spectrophotometric method for carotene are recorded for butters obtained at various periods of lactation. A. G. P.

**Colour test for vitamin-A.** A. E. PACINI and M. H. TARAS (J. Amer. Pharm. Assoc., 1937, 26, 721—723).—The colour tests given by various reagents with vitamin-A are modified by presence of Cl-containing substances (e.g., HClO<sub>4</sub>, SOCl<sub>2</sub>). -A with a reagent containing PhOH, guaiacol, and HClO<sub>4</sub> in CHCl<sub>3</sub> gives a purple colour developing into a bright red which appears to be sp. for -A (cf. Rosenthal and Erdelyi, A., 1934, 1145). F. O. H.

**Vitamin-A and -D contents of light, medium, and dark egg-yolks.** B. BISBEY, S. COVER, V. APPLEBY, and A. WEIS (Missouri Agric. Exp. Sta. Ann. Rept. [1933], Bull., 1934, No. 340, 60—61).—The -A content of dark yolks averages four times that of light yolks. CH. ABS. (*p*)

(A) Antithyrogenic action of crystalline vitamin-B. (B) Influence of hyperthyroidism on vitamin-A reserves of the albino rat. B. SURE and K. S. BUCHANAN (J. Nutrition, 1937, 13, 513—519, 521—524).—(A) The efficiency of vitamin-B in overcoming

the toxicity of thyroxine (I) depends on the source of the stable components of the *-B* complex. When these components are provided by autoclaved baker's yeast cryst. *-B* becomes an active antithyrogenic agent.

(B) Diet containing 50% of dried skim milk provides sufficient of the stable components of *-B* to permit observation of the response of rats to cryst. *-B* as an antithyrogenic agent. Such a ration containing 10% of butter fat and cod-liver oil (4 drops per animal per day) does not provide sufficient *-A* to counteract the rapid catabolism produced by daily administration of 0.2 mg. of (I).  
A. G. P.

**Vitamin-B complex. Presence of a third factor.** R. J. BLOCK and R. B. HUBBELL (Yale J. Biol. Med., 1935, 8, 169—174).—In rat feeding trials evidence was obtained of a third factor in the *-B* complex of rice polishings, which is adsorbed by Lloyd's reagent and is eluted by dil. NaOH but not by EtOH-HCl.  
CH. ABS. (p)

**Formation of vitamin-B complex in the digestive tract of the rat.** N. B. GUERRANT, R. A. DUTCHER, and R. A. BROWN (J. Nutrition, 1937, 13, 305—315).—Presence of 10—20% of hydrogenated cottonseed oil in a *-B*-deficient diet containing sucrose does not facilitate production of *-B* in the digestive tract. Autoclaving starch for > the customary 4 hr. period does not increase the amount of supplementary substance in rat faeces. Diets which increase faecal matter, and have low *d* and high reducing equiv., favour the production in the digestive tract of substances which are effective in supplementing a *-B*-deficient diet.  
A. G. P.

**Action of the individual components of the vitamin-B complex on the volume increase of the adrenal cortex produced by physical work.** J. PERJES (Pflüger's Archiv, 1936, 238, 341—344).—Neither vitamin-*B*<sub>1</sub> nor lactoflavin (I), nor *-B*<sub>1</sub> and (I) together, prevented adrenal hypertrophy through physical work, whereas beer yeast extract autoclaved at 120° for 6 hr. had a definite inhibiting effect.  
M. A. B.

**Effects of ultra-violet rays on vitamin-B.** A. G. HOGAN and L. R. RICHARDSON (Missouri Agric. Exp. Sta. Ann., Rept. [1933], Bull., 1934, No. 340, 26—27).—Irradiation with a quartz-Hg arc destroys one component of the vitamin-B complex. Irradiation of a solution of tiki-tiki and liver extract destroyed a considerable proportion of the *-B* activity.  
CH. ABS. (p)

**Effect of vitamin-B and iodine on the weight, iodine content, and structure of the thyroid gland of the rat.** M. D. CARPENTER and G. R. SHARPLESS (J. Nutrition, 1937, 13, 235—247).—Deficiency of vitamin-B did not affect the size, structure, or I content of the thyroid gland, but when coupled with deficiency of I (0.0038% of the diet) caused a condition simulating colloid goitre. The latter did not appear with a diet containing 0.019% of I or *-B*. Autoclaving yeast causes loss of a factor (not included in *-B*) which increases the [I] and total I content of the thyroid.  
A. G. P.

**Alleviation of vitamin-B deficiency in the rat by certain natural fats and synthetic esters.**

W. D. SALMON and J. G. GOODMAN (J. Nutrition, 1937, 13, 477—500).—Large proportions of fat added to a vitamin-B-deficient diet diminished the incidence of beri-beri in rats, coconut fat being notably effective. The efficiency of individual esters of fatty acids varied with the length of the C chain of the acids, max. being attained with 8 C. Glyceryl hexoate and octoate cured spastic beri-beri in rats. The apparent nutritive val. of fats in *-B*-deficient rations differed from that of rations containing *-B*. *-B* was more efficient than autoclaved yeast in retarding the appearance of beri-beri. A high intake of protein or of *-B*<sub>2</sub> was not a requisite for the action of fat in alleviating *-B* deficiency. The *n* of the fatty fraction of fat from brain and liver and the magneto-optical properties of hexoic and octoic acids from these fractions showed no differences attributable to *-B* deficiency.  
A. G. P.

**Adsorption of vitamin-B by plant tissue (*Solanum melongena*, L., and *Raphanus sativus*, var. *longipannatus*, Bailey) when pickled with salt and rice bran.** C. D. MILLER (J. Nutrition, 1936, 13, 687—694).—After pickling in salt and rice bran the eggplant and takuan (a prep. of *R. sativus*) showed markedly increased *-B* contents, and the tissues (leaf, fruit, or root) attained *p<sub>H</sub>* 4.7—4.8, a condition favouring adsorption of *-B* from the rice bran.  
A. G. P.

**Dynamics of blood-cholesterol during development of avitaminosis-B in pigeons.** A. BRUCK (Z. Vitaminforsch., 1937, 6, 289—295).—The periods of latent, developing, and established avitaminosis-*B*<sub>1</sub> are associated with normal (0.032—0.050, average 0.043%), increasing, and diminishing (i.e., back to normal levels) vals. of the blood-cholesterol, respectively.  
F. O. H.

**Vitamin-B. I. Relationship between deficiency of vitamin-*B*<sub>1</sub> and bradycardia.** G. W. PARADE (Z. Vitaminforsch., 1937, 6, 327—334).—The bradycardia occurring during avitaminosis-*B*<sub>1</sub> is due to inanition.  
F. O. H.

**Effect of vitamin-*B*<sub>1</sub> deficiency on heat production of the rat.** LE R. VORIS (J. Nutrition, 1937, 14, 199—213).—Heat production of *-B*<sub>1</sub>-deficient rats was < normal over a period of 7 weeks. Supplementary feeding of *-B*<sub>1</sub> resulted in an increased proportion of the ration being metabolised, a more favourable energy balance, less energy, and a lower proportion of C to N in urine, and a greater % retention (as body gain) of the digested N.  
A. G. P.

**Sparing action of lactoflavin on vitamin-*B*<sub>1</sub>.** L. N. ELLIS and A. ZMACHINSKY (Science, 1937, 86, 245—246).—With young rats, the growth and length of survival during the period of feeding on a vitamin-*B*<sub>1</sub>-deficient diet was directly dependent on the lactoflavin (I) content of the maternal diet, showing that (I) spared the *-B*<sub>1</sub> reserves of the body.  
L. S. T.

**Vitamin-*B*<sub>1</sub> craving in rats.** C. P. RICHTER, L. E. HOLT, jun., and B. BARELARE, jun. (Science, 1937, 86, 354—355).—Rats show an excessive appetite for vitamin-B either as *B*<sub>1</sub> (betaxin or betalin) or as riboflavin.  
L. S. T.

**Effect of vitamin- $B_1$  on the activity of acetylcholine.** B. MINZ and R. AGID (Compt. rend., 1937, 205, 576—577).—Vitamin- $B_1$  in very low concn. sensitises eserinated leech muscle to the action of acetylcholine (I) (1 in  $10^8$ ). Higher concns. reduce the sensitivity of the prep. - $B_1$  does not afford (I) additional protection against hydrolysis and may be identical with the sensitising substance found previously (Arch. Internat. Physiol., 1936, 42, 281) in the vagus. J. L. D.

**Chemical nature of vitamin- $B_1$ .** G. NARASIMHAMURTHY (Indian J. Med. Res., 1936, 24, 221—231).—Electrophoresis and micro-cataphoresis experiments show that the isoelectric point of vitamin- $B_1$  lies between  $p_H$  9.0 and 10.0, nearer to the former. On the acid side - $B_1$  migrates consistently to the cathode, but on the alkaline side some irregularity occurs. R. N. C.

**Synthesis of the antineuritic vitamin.**—See A., II, 525.

**Use of yeast or other fungi for vitamin- $B$ , tests.** R. J. WILLIAMS (Science, 1937, 86, 349—350).—Such use is of questionable val. L. S. T.

**Chemical determination of vitamin- $B_1$  in food-stuffs and biological material by means of the thiochrome reaction.** M. A. PYKE (Biochem. J., 1937, 31, 1958—1963).—The application of Jansen's method (A., 1937, III, 77) is described. F. O. H.

**Determination of vitamin- $B_1$  in male urine.** W. KARRER (Helv. Chim. Acta, 1937, 20, 1147—1155).—Vitamin- $B_1$  in urine is adsorbed on C and the adsorbate treated by the method of Karrer and Kubli (A., 1937, III, 281). If the natural fluorescence of urine is taken into account,  $3-5 \times 10^{-6}$  g. of - $B_1$  per 100 c.c. of urine can be determined with sufficient accuracy. In one instance with normal diet,  $97 \times 10^{-6}$  g. of - $B_1$  occurred in the urine in 24 hr. After oral administration of larger amounts of - $B_1$ , only about 3—5% is found in the urine; the greater is the dose, the smaller is the % excretion. A transitory retention of - $B_1$  in the body is established. Digestive enzymes do not decompose - $B_1$ . H. W.

**Determination of vitamin- $B_1$  and - $B_2$  in human urine by the rat-growth method.** O. M. HELMER (J. Nutrition, 1937, 13, 279—286).—With excess of vitamin- $B_1$  in the diet (Cowgill's formula), - $B_1$  is detectable in urine. In normal urines the amount of - $B_2$  is  $>$  that of - $B_1$ . A. G. P.

**Effect of yeast on liver-glycogen of white rats during hyperthyroidism.** V. A. DRILL (J. Nutrition, 1937, 14, 355—364).—The liver-glycogen of rats receiving low levels of vitamin- $B_1$  and - $B_2$  (yeast) diminished after subcutaneous injection of thyroxine, but continued at normal levels if the diet included adequate - $B_1$  and - $B_2$  supplies. A. G. P.

**Vitamin- $B_1$  and - $B_2$  values of peas and Lima beans under various conditions.** M. S. ROSE and E. H. F. PHIPARD (J. Nutrition, 1937, 14, 55—67).—The vitamin- $B_1$  content of peas is not affected by freezing but decreases by 26% on cooking. Maturation of peas and Lima beans involves a loss of 50% of their - $B_1$  contents. Peas germinated and grown  
D D (A., III.)

14 days in sand lost 50% of their - $B_1$ , but synthesised - $B_2$ . The vitamin content of Lima beans varied with the locality of growth. Freezing caused no loss of - $B_2$  in either seed. A. G. P.

**Vitamin studies.** R. REIDER (Oklahoma Agric. Exp. Sta. Rept. [1932—4], 1934, 184—187).—In rats deprived of vitamin- $B_1$  and - $B_2$  carbohydrate absorption proceeded normally. - $B$  promotes growth by increasing the plane of nutrition by stimulating the appetite. The sp. growth effect of - $B$  is not demonstrable in adult rats. CH. ABS. (p)

**Vitamin- $B_2$  content of some foods.** H. LEVINE and R. R. REMINGTON (J. Nutrition, 1937, 13, 525—542).—Cottonseed meal, soya beans, dried whole milk, and dried brewer's yeast were good sources of vitamin- $B_2$ . The - $B_2$  potency of milk from pellagrous was similar to that from other localities. Extraction of cottonseed meal with EtOH removes 50% of the - $B_2$  content. No - $B_2$  was destroyed in the extraction process. Pressure-cooking (15 lb., 30 min.) did not destroy the - $B_2$  of cottonseed meal or soya beans. A. G. P.

**Identity of flavin with the cataract-preventive factor.** P. L. DAY, W. J. DARBY, and W. C. LANGSTON (J. Nutrition, 1937, 13, 389—399).—Young rats receiving a vitamin- $B$ -free diet supplemented with rice polishings extract developed cataract. Addition of lactoflavin (I) to the diet prevented this. (I) failed to prevent "rat pellagra." A. G. P.

**Biological assay of lactoflavin with chicks.** T. H. JUKES (J. Nutrition, 1937, 14, 223—233).—The technique is described, and data so obtained for numerous foodstuffs are recorded. A. G. P.

**Lactoflavin.** H. VETTER (Ergebn. Physiol., 1936, 38, 855—876).—A review. W. McC.

**Effect of extracts of rice polishings and beef liver on pellagra-like symptoms of rats due to a high-sucrose diet.** U. TANGE (Bull. Inst. Phys. Chem. Res. Japan, 1937, 16, 1058—1070).—Rats fed on a diet in which sucrose or dextrin is the source of carbohydrate develop dermatitis (more easily in the former case) which is cured by an adsorbate [Gyorgy's vitamin- $B_6$  (?)] on acid clay at  $p_H$  2.5 of extracts of rice polishings. Growth is poor, but it is increased when an acid clay adsorbate of ox liver extract or a conc. prep. of this substance is fed in addition. J. L. D.

**Dietary production of the syndrome of deficiency in vitamin- $B_6$ .** W. HALLIDAY and H. M. EVANS (J. Nutrition, 1937, 13, 657—667).—A high-sucrose, low-fat diet containing casein extracted with hot 95% EtOH and cold 60% EtOH consistently induces the syndrome of vitamin- $B_6$  deficiency. Cystine removed from casein by EtOH treatment is not a factor in - $B_6$  deficiency. A. G. P.

**Relation of vitamin- $B$  and - $C$  in regard to beri-beri.** J. L. ROSEDALE and L. P. CHONG (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, 1, 337—344).—Confirmation is obtained that vitamin- $B_1$  consists of an antineuritic factor and a second concerned in the maintenance of good general condition. Vitamin- $C$  from pineapple juice can

probably replace the antiberi-beri factor in  $-B_1$ . It is postulated that  $-C$  and  $-B_1$  form a " $H_2O$ -sol. vitamin complex" which is essential for normal metabolism, and breaks down into  $-C$  and the components of  $-B_1$  only under certain conditions.

CH. ABS. (p)

**Vitamin-B and -C content of marine algæ.** E. R. NORRIS, M. K. SIMEON, and H. B. WILLIAMS (J. Nutrition, 1937, **13**, 425—433).—The vitamin-B content of a no. of algæ examined compared favourably with that of many fruits and vegetables. Species of *Porphyra* were particularly rich in  $-B$  and  $-C$ . Algæ growing in the littoral zone or on the surface tend to have higher  $-C$  contents than those dredged from the sea bottom (5—10 fathoms). A. G. P.

**Effect of vitamin-C on the action of insulin in the organism.** E. LIPPMANN and T. SANGUINETTI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 317—319).—Data for the reducing power of the urine of guinea-pigs following administration of glucose with and without ascorbic acid (I) do not indicate any interference by (I) of *in-vivo* insulin action similar to that occurring *in vitro* (Freudenberg and Wegmann, A., 1935, 789). F. O. H.

**Saturation of a scurvy patient with small doses of ascorbic acid. Daily human requirement.** P. SCHULTZER (Biochem. J., 1937, **31**, 1934—1938).—On a vitamin-C-free diet the daily excretion of ascorbic acid (I) was 11 mg. Saturation was reached in 23 days with daily intravenous injection of 40 mg. of (I) when 26 mg. per day were excreted, the daily human requirement probably being <40 mg.

H. G. R.

**Relation of ascorbic acid ingestion to mineral metabolism in children.** A. L. DANIELS and G. J. EVERSON [with O. E. WRIGHT, M. F. DEARDORFF, and F. I. SCULAR] (J. Nutrition, 1937, **14**, 317—328).—Ingestion of ascorbic acid (I) at levels of 25—12.5 mg. per kg. had no effect on retention of Ca, P, and Mg. Ca and P retentions were unrelated to the Ca and (I) contents of the diet when > the physiological min. of either was given. The N retention of children receiving < the min. (I) requirement was < when adequate (I) was given. Ingestion of (I) > the physiological requirement produced no further increase in N retention. Orange juice (60 and 100 c.c. daily) had no influence on Ca, P, Mg, or N retentions.

A. G. P.

**Urinary elimination of certain substances following administration of ascorbic acid.** F. M. CHIANCONE (Arch. Farm. sperim., 1937, **64**, 160—163).—Ingestion of ascorbic acid by men decreases the excretion of neutral S, probably due to increased oxidation within the organism.

F. O. H.

**Action of vitamin-C and its organo-metallic compounds on development and fermenting power of the *Vibrio septique*.** F. ARLOING, A. MOREL, A. JOSSERAND, L. THEVENOT, and R. CAILLE (Compt. rend. Soc. Biol., 1937, **125**, 347—349).—The fermenting power is increased by ascorbic acid and to a smaller extent by dehydroascorbic acid, metallic derivatives, and oxidation products having an oxidation-reduction function.

H. G. R.

**Effect of diphtheria toxin on vitamin-C *in vitro*.** C. C. TORRANCE (J. Biol. Chem., 1937, **121**, 31—36).—When the toxin and lemon juice are mixed *in vitro*, the ascorbic acid (I) has no effect on the toxin within the  $p_H$  range of mammalian muscle; although the (I) content decreases, the effect of different toxins does not vary in proportion to their toxicity in guinea-pigs. Heated culture filtrates have the same action as unheated. The destruction of the (I) content by toxic filtrates *in vitro* is reversible.

P. W. C.

**Effect of administration of acid and alkaline salts on the ascorbic acid contents of guinea-pig tissues.** E. E. HAWLEY, R. G. DAGGS, and D. J. STEPHENS (J. Nutrition, 1937, **14**, 1—8).—Administration of  $NaHCO_3$  in amounts sufficient to cause high alkalinity in urine increases the ascorbic acid contents in the adrenals and liver of guinea-pigs.

A. G. P.

**Ascorbic acid in aqueous humour.** J. FRANTA (Compt. rend. Soc. Biol., 1937, **126**, 110—113).—Ascorbic acid in aq. humour is not formed solely by the crystallin.

H. G. R.

**Migration of ascorbic acid (vitamin-C) in an electrical field.** S. RANGANATHAN and G. SANKARAN (Indian J. Med. Res., 1936, **24**, 213—220).—Ascorbic acid (I) migrates to the positive pole at all  $p_H$  levels between 1.0 and 13.0; phenolphthalein migrates only at  $p_H > 8.5$ , and fructose does not migrate at all. (I) must hence contain a free  $CO_2H$ , but no lactone structure or acidogenic  $\cdot CH(OH) \cdot CO \cdot$  group. The rate of destruction of (I) in solution increases with  $p_H$ .

R. N. C.

**Preparation of ascorbic acid.** A. A. SCHMIDT and K. Z. TOULTCHINSKAIA (Bull. Soc. Chim. biol., 1937, **19**, 1200—1208).—Aq. extracts of 14.8 kg. of sweet briar berries are conc. in a vac. and treated successively with EtOH and  $Et_2O$ , impurities filtered off, and the filtrate is evaporated almost to dryness. The product is again treated with EtOH- $Et_2O$  and finally cryst. from EtOH-light petroleum (yield 52.21 g.).

P. W. C.

**Infra-red absorption spectrum of vitamin-C.**—See A., I, 495.

**Quinone reactions.**—See A., II, 530.

**Relation of vitamin-D to skin respiration.** A. K. PRESNELL (J. Biol. Chem., 1937, **121**, 5—8).—The  $O_2$  uptake of the skins of rachitic rats is only 60—70% of that of the skins of rats of the same age on the same diet with the exception that a small amount of vitamin-D sufficient to prevent rickets had been added. When  $-D$  was added to the diet of the rachitic rats, recovery from rickets was accompanied by increase of skin respiration to normal vals.

P. W. C.

**Multiple nature of the vitamin-D of fish oils.** C. E. BILLS, O. N. MASSENGALE, M. IMBODEN, and H. HALL (J. Nutrition, 1937, **13**, 435—452).—Differences in the vitamin-D potency per rat unit of fish-liver oils are attributed to the existence of two or more forms of  $-D$ . The efficiency of irradiated ergosterol was < that of many fish oils. The efficiency of irradiated 7-dehydrocholesterol approximated to that of cod-liver oil or irradiated cholesterol but was

< that of white sea bass-liver oil. Oils from related species differed widely in  $-D$  efficiency. A. G. P.

**Selectively irradiated ergosterol.** T. H. RIDER, G. SPERTI, G. P. GOOD, and H. G. CASSIDY (J. Amer. Med. Assoc., 1936, 106, 452—456).—Selective long-wave ultra-violet irradiation activates ergosterol (I) without formation of undesirable decomp. products. A vegetable oil solution of (I) containing 10,000 units per g. can be prepared. CH. ABS. (p)

**Antirachitic vitamin of the liver-oil of the blue-fin tunny.** H. BROCKMANN and A. BUSSE (Z. physiol. Chem., 1937, 249, 176—180; cf. A., 1936, 1161).—The oil contains vitamin- $D_3$ , which is isolated by a modification of the method previously described. W. McC.

**Relation of vitamin-E to sterility in dairy cows.** C. Y. CANNON, D. L. ESPE, and B. H. THOMAS (Iowa Agric. Expt. Sta. Rept. Agric. Res., 1934, 55).—Destruction of vitamin-E in the ration for milch goats did not affect the fertility of the goats in the first gestation period. CH. ABS. (p)

**Effect of vitamin-E deficiency on growth.** G. A. EMERSON and H. M. EVANS (J. Nutrition, 1937, 14, 169—178).—Wheat-germ oil added to vitamin-E-deficient diets prevented sterility and increased growth rates of rats. The growth-providing factor occurs in the unsaponifiable fraction of the oil. A. G. P.

**Vitamin-E and growth.** H. S. OLCOTT and H. A. MATTILL (J. Nutrition, 1937, 14, 305—315).—A synthetic vitamin-E-free diet containing extracted casein and yeast, sucrose, Et esters of hydrogenated cottonseed oil fatty acids, carotene, calciferol, and a salt mixture produced similar adolescent growth of rats as did the same diet supplemented with -E concentrates. From 2 months onwards the -E-supplemented animals showed relatively the greater growth. Early normal growth is not dependent on -E. A. G. P.

**Vitamin-E (tocopherol).** J. C. DRUMMOND and A. A. HOOVER (Biochem. J., 1937, 31, 1852—1860).—A two-stage adsorption process after gross removal of sterols gave higher yields of active material than could be obtained by partition between pentane and 92% MeOH followed by a single adsorption. By freezing the MeOH solution of the fractions or from the digitonide ppt. there was obtained a sterol, m.p. 156°, separable into two fractions,  $C_{29}H_{46}O$ , m.p. 141—142° (3:5-dinitrobenzoate, m.p. 202—203°,  $[\alpha]_D^{20} -7.2^\circ$  in  $CHCl_3$ ), and  $C_{29}H_{46(44)}O$ , m.p. 156° (3:5-dinitrobenzoate, m.p. 180—182°,  $[\alpha]_D^{20} +15.7^\circ$  in  $CHCl_3$ ). A further sterol (probably  $\alpha$ -tritisterol) was also isolated from the digitonide ppt. Attempts to prepare allophanates from the original fractions resulted only in the isolation of  $\beta$ -tocopherol allophanate, m.p. 138°, the regenerated tocopherol from which conformed to the formula  $C_{29}H_{50}O_2$ . The surface spreading properties tend to a limiting area of 65 sq. A., or of 80 sq. A. following oxidation by neutral 0.01N- $KMnO_4$ , and are compatible with a sterol structure. P. G. M.

**Vitamin-E.** G. J. MARTIN (J. Nutrition, 1937, 13, 679—685).—An attempt to separate vitamin-E into two fractions is described. A growth-stimulating

factor is demonstrated in concentrates previously considered to contain only the anti-sterility factor. A. G. P.

**Cumotocopherol, a new factor of the vitamin-E group.** W. JOHN (Z. physiol. Chem., 1937, 250, 11—24; cf. Evans *et al.*, A., 1936, 531; Fernholz, A., 1937, II, 339).—In the analysis of the unsaponifiable matter of wheat-germ oil, the mother-liquor from which  $\alpha$ -tocopheryl allophanate separates yields the *allophanate* (I), m.p. 146°,  $[\alpha]_D^{25} +6.7^\circ$  in  $CHCl_3$ , of *cumotocopherol* (II),  $C_{28}H_{48}O_2$ , and a *hydrocarbon*, probably  $C_{18}H_{38}$ , m.p. 63°. (II) at 350—370° yields 2:3:5-trimethylquinol (III). Probably (II) and  $\alpha$ -tocopherol are the mono-ethers of  $C_{13}H_{37}OH$  and (III) and 2:3:5:6-tetramethylquinol respectively. (I) and (II) exhibit max. absorption of ultra-violet light at 280 and 295 m $\mu$ ., respectively. (II) exhibits anti-sterility action on rats in doses of 8 mg. but does not restore normal lactation in the females. W. McC.

**Biological assay of vitamin-E. Application to wheat germ and wheat-germ oil.** L. S. PALMER (Ind. Eng. Chem. [Anal.], 1937, 9, 427—429).—Assay of vitamin-E by oral administration to rats is described. Results are only approx. quant.; methods of expressing them are discussed. Expression of the oil from wheat germ removes the vitamin without loss. Wheat germ is stable for 1 year in an evacuated tin whilst the oil is stable for several months in sealed containers at  $<0^\circ$ . R. S. C.

**Oats and lettuce carry needed factor for lactation.** C. R. MEYER (Illinois Agric. Exp. Sta. 47th Ann. Rept. [1933—4], 1935, 248—249).—Successful lactation in rats receiving a purified diet containing all known essentials was obtained by supplementary feeding of lettuce, oats, or  $Et_2O$ -extract of oats. The lactation factor was not supplied by cod-liver or wheat-germ oils or by yeast. CH. ABS. (p)

**Growth-promoting factor associated with summer milk.** G. O. KOHLER, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1937, 14, 131—144).—Growth of rats receiving mineralised winter milk was stimulated by supplements of grass or grass juice, rice bran, and liver extract, the effect being accompanied by an increased consumption of the milk. The active factor is not vitamin-A, -D, -C, - $B_1$ , - $B_2$ , - $B_4$ , - $B_6$ , flavin, choline, "goat-milk factor," or " $EtOH-Et_2O$  ppt. factor." A. G. P.

**New essential dietary factor in mammalian liver.** W. HALLIDAY and H. M. EVANS (J. Nutrition, 1937, 14, 45—54).—The conclusions of Elvehjem (A., 1936, 1568) are examined. The  $EtOH-Et_2O$  pptn. procedure carries down vitamin- $B_6$  leaving flavin in the supernatant liquid. A new dietary factor other than - $B_1$ , - $B_2$ , - $B_4$ , and - $B_6$  could not be demonstrated. A. G. P.

**Antihæmorrhagic vitamin.** H. J. ALMQUIST (J. Biol. Chem., 1937, 120, 635—640; cf. A., 1937, III, 365).—An improved process for the isolation of the vitamin (I) is described. The process involves mol. distillation and crystallisation from MeOH at low temp. (I) is a colourless, cryst. substance of low m.p. containing  $\leq$  one  $C_6H_6$  ring. A. L.

**Assay procedure for vitamin-K (antihæmorrhagic vitamin).** H. J. ALMQUIST and E. L. R. STOKSTAD (J. Nutrition, 1937, **14**, 235—240).—Determination of hæmoglobin in the assay of vitamin-K (method described) is unnecessary since avitaminosis-K is not a primary cause of anæmia in chicks. -K occurs in soya-bean oil. A. G. P.

**Influence of diet on skin abnormalities in rats.** H. VON EULER and M. MALMBERG (Z. Vitaminforsch., 1937, **6**, 325—327).—The symptoms of avitaminosis-H due to ovalbumin (I) are not produced, but are alleviated, by replacement of (I) by caseinogen, serum-albumin, or Witte's peptone (cf. A., 1937, III, 439). F. O. H.

**Vitamin-H.** I. ABELIN (Z. Vitaminforsch., 1937, **6**, 334—336).—Loss of hair and skin lesions in rats fed only on rusks or coarse wheat-meal biscuits are cured by administration of products (e.g., kidney, liver) rich in vitamin-H or, more slowly and less effectively, by that of cystine or dried thyroid substance. F. O. H.

**Gizzard factor of the chick.** H. J. ALMQUIST and E. L. R. STOKSTAD (J. Nutrition, 1937, **13**, 339—350).—Gizzard erosion results from deficiency of a fat-sol. factor which is not identical with any known vitamin. The factor is readily destroyed by heat and by alcoholic KOH and is adsorbed from  $C_6H_{14}$  solution by activated MgO. Dried greens and wheat bran are good sources of this factor, which has no apparent influence on the growth of chicks. A. G. P.

**Sources and nature of the chick gizzard factor.** H. J. ALMQUIST (J. Nutrition, 1937, **14**, 241—245).—The gizzard factor is unstable to heat and to EtOH. It is present in the gizzard lining but is unrelated to growth rate. A. G. P.

**Effect of administration of ascorbic acid and vitamin-P on the content of erythrocytes capable of being stained in guinea-pigs' blood.** H. VON EULER and M. MALMBERG (Z. physiol. Chem., 1937, **249**, 85—92).—In healthy guinea-pigs administration of large doses of vitamin-C or -P scarcely affects the proportion of erythrocytes capable of being stained in the blood. In scorbutic guinea-pigs the administration of -C or -P causes very rapid and great (up to 30%) increase of short duration in the proportion. Combined administration of -C and -P has a similar but more prolonged effect. W. McC.

**Vitamin-P.** S. S. ZILVA (Nature, 1937, **140**, 588).—No vitamin-P activity occurred with daily doses of either "citrin," hesperidin (I), or (I) + eriodictyol administered to guinea-pigs on a scorbutic diet. With sub-optimal preventive doses of ascorbic acid, a biological response similar to that observed by Szent-Gyorgyi *et al.* was obtained. The bearing of these results on Bentsath and Szent-Gyorgyi's latest view (A., 1937, III, 441) concerning the action of -P is discussed. L. S. T.

**[Essential dietary] factor W.** D. V. FROST and C. A. ELVEHJEM (J. Biol. Chem., 1937, **121**, 255—273; cf. A., 1936, 1568).—Rats on an otherwise adequate diet grow normally only when sufficient quantities of flavin and of factor W ("factor pptd.

by EtOH-Et<sub>2</sub>O") are added. The material in the filtrate obtained from liver extract after pptn. of the pernicious anæmia factor yields W when extracted with aq. COMe<sub>2</sub> containing HCl, the COMe<sub>2</sub> being subsequently removed and the aq. residue purified by filtration and treatment with fuller's earth. W is destroyed by treatment with C but is stable towards cold acid and alkali and is not destroyed by boiling for short periods at 1.0 and 9.0. It is resolved into two components by treatment in H<sub>2</sub>O with Hg(OAc)<sub>2</sub> or Ba(OAc)<sub>2</sub>, both the ppt. and the filtrate containing growth-promoting material. Optimal growth is obtained only when the components are combined. Adenine nucleotide (I), added to the diet in place of W, has an immediate but not continuous growth-promoting effect and nicotinamide (II), used in the same way, promotes growth after approx. two weeks. Immediate and continuous growth follows when (I) + (II) replace W. W has strong reducing powers and is probably related to (I) and (II). W. McC.

**Serial cultures of vegetable tissues grown on synthetic media.** P. NOBÉCOURT (Compt. rend., 1937, **205**, 521—523).—Sections of carrot, kept under suitable conditions for several weeks, show proliferation of tissue cells. A method for growing these new cells, free from the parent tissue, through three generations is described. J. L. D.

**Cultures of cambial tissue.** R. GAUTHERET (Compt. rend., 1937, **205**, 572—573).—Hetero-auxin in concns. >1 in 10<sup>10</sup> stimulates the growth of the isolated cambium of *Salix caprea*, whereas with concns. of 1 in 10<sup>4</sup> or 10<sup>5</sup> growth is impeded. Cysteine hydrochloride acts similarly but is less toxic. Vitamin-B<sub>1</sub> is very active as a growth accelerator; the newly formed cells, free from the original tissue, reproduce prolifically. J. L. D.

**Membrane tension and orientation of structure in the plant cell wall.** E. S. CASTLE (J. Cell. Comp. Physiol., 1937, **10**, 113—121).—The micellar orientation in the growing plant cell wall is explained on the basis of differences in tension along different directions in the wall. M. A. B.

**Influence of weak electric currents on the growth of the coleoptile.** N. G. CHOLODNY and E. C. SANKOWITSCH (Plant Physiol., 1937, **12**, 385—408).—Passage of a current (10<sup>-7</sup>—10<sup>-6</sup> amp.) from base to apex caused a brief acceleration followed by a decline in the growth rate of coleoptiles. Currents in the reverse direction cause a diminution in growth rate which is maintained after the current ceases. The current causes translocation of the growth hormone, not directly as an electrolyte, but indirectly through the protoplasmic system. Theories of Went and of Kogl on the mechanism of action of the hormone are discussed. A. G. P.

**Staining of plastids in fixed plant cells by acid fuchsin and toluidine-blue, in relation to p<sub>H</sub>.** H. DRAWERT (Flora, 1937, **31**, 341—354).—Absorption of dyes by plastids and by gelatin (I) varies with p<sub>H</sub>. In gelatin diffusion of acid dye diminishes and absorption increases with rising p<sub>H</sub>. The reverse is true of basic dyes. The uptake of dye is unrelated

to the degree of swelling of (I) at any  $p_H$  examined. Electrostatic adsorption is the principal factor in the uptake of dyes. The isoelectric point of the adsorbent and the  $[H^+]$  of the dyes are of primary importance in vital staining and in the staining of fixed plant tissues.

A. G. P.

**Exchange of electrolytes between roots and acid solutions.** R. BEALL (Plant Physiol., 1937, 12, 455—470).—Certain org. and inorg. acids were absorbed from very dil. solutions by roots of *Lupinus albus*, the rate of intake increasing (within limits) with concn., and at any given concn. with the degree of dissociation of the acid. Subsequent injury to plants was due to  $H^+$  (absorption of which was rapid), except in the case of  $EtCO_2H$  in which the undissociated mol. was largely concerned. Absorption of acids was frequently followed by exosmosis from roots, thus indicating increased permeability of cell membrane or rapid destruction of cell contents.

A. G. P.

**Mechanism of bursting of fruits of *Impatiens balsamina*, Linn.** P. PARIJA and P. MALLIK (J. Indian Bot. Soc., 1936, 15, 59—61).—The phenomenon is explained by local and seasonal differences in cell sap concn.

CH. ABS. (p)

**Reduction of silver nitrate by chromatophores of zygnuma and other green algæ.** E. A. BORISCHENKO (Bull. soc. nat. Moscou, Sect. biol., 1935, 44, 5—14).—Reduction of  $AgNO_3$  by plastids occurs only in live tissue. The lipid phase (containing chlorophyll) shows the greatest activity in this respect.

CH. ABS. (p)

**Absorption and transpiration [in plants]. II. Cut shoots treated with different concentrations of sodium chloride, potassium nitrate, and formalin solutions.** T. EKAMBARAM and I. M. RAO (J. Indian Bot. Soc., 1935, 14, 183—236).—All three substances decreased the rate of absorption as the solutions passed up the stems of *Barleria cristata*, the effect being intensified as the solutions entered the leaves. After entry absorption was further diminished by  $NaCl$ , diminished but to a small extent by  $KNO_3$ , and increased, in some cases to initial rates, by  $CH_2O$ . Transpiration was affected only when the solutions entered the leaves,  $NaCl$  causing a steady diminution,  $KNO_3$  effecting an initial decrease followed by a slow increase, and  $CH_2O$  causing a steady increase. Relations between absorption and transpiration are discussed.

CH. ABS. (p)

**Accumulation of salts in tips of avocado leaves in relation to tip-burn.** A. R. C. HAAS (Calif. Avocado Assoc., Year Book, 1935, 105).—Burning occurs when leaves accumulate excessive amounts of  $Cl$ .

CH. ABS. (p)

**Ash analysis in the investigation of living functions of plants.** K. ARENS (Landw. Jahrb., 1936, 82, 453—463).—The washing of mineral matter from leaves by rain and the exudation of nutrients from roots of maturing plants are discussed in relation to the val. of ash analyses in the examination of nutritional problems in plants.

A. G. P.

**Effect of certain nutrient deficiencies on stomatal behaviour.** M. C. DESAI (Plant Physiol., 1937, 12, 253—283).—Deficiency of  $N$ ,  $P$ , or  $K$  caused

sub-normal stomatal activity, less response to environmental changes, and a tendency towards a less uniform distribution of stomata over the leaf although the average no. of stomata per unit leaf area remained unchanged. Excess of  $K$  slightly retarded stomatal movement. Diminution of stomatal activity is associated with increased  $H_2O$  requirement and a decline in size and yield of the plants.

A. G. P.

**Production of citrus mottle-leaf in controlled nutrient cultures.** H. D. CHAPMAN, A. P. VANSLOW, and G. F. LIEBIG, jun. (J. Agric. Res., 1937, 55, 365—379).—Mottling was produced in rooted orange cuttings by omission of  $Zn$  from culture solutions. The extent of mottling was greater in a high than in low light intensity and was increased by raising the proportion of  $PO_4^{3-}$  supplied. After frequent applications of small amounts of  $Zn$  mottled leaves slowly became normal.

A. G. P.

**Relationships between the calcium and oxalate contents of foliage of certain forest trees.** R. F. CHANDLER, jun. (J. Agric. Res., 1937, 55, 393—396).—The total  $C_2O_4^{2-}$  in various species of forest tree leaves is directly correlated with the total  $Ca^{++}$  content and in no case is  $>$  the equiv. of total  $Ca^{++}$ . Except in two species  $C_2O_4^{2-}$  occurred as  $CaC_2O_4$ .  $C_2O_4^{2-}$ -free leaves may have high  $Ca^{++}$  contents.

A. G. P.

**Physiology of hard winter wheat plants.** E. C. MILLER (Kansas Agric. Exp. Sta. Ann. Rept. [1932—4], 1934, 54—55).—Approx. 57% of the  $N$  in the mature heads was absorbed from soil between heading and maturity. At heading 75% of the total  $P$  of the plant was  $H_2O$ -sol. Although subsequent intake of  $P$  until maturity was very small the  $H_2O$ -sol.  $P$  diminished to 50% of the total. The  $K$  content of the entire plant decreased by approx. 25% in the final 3 weeks of maturation. Approx. 45% of the carbohydrate of mature heads was derived from reserves in stems and leaves, the remainder being photosynthesised and translocated in leaves during maturation.

CH. ABS. (p)

**Separation of crystals in the cell sap of Desmidiaceæ.** K. ONDRACEK (Planta, 1936, 36, 222—225).—The crystals are of  $CaSO_4$  which acts as a reserve accumulation.

A. G. P.

**Physiology of saprophytic algæ and flagellates. I. *Chlorogonium* and *Hyalogonium*. II. *Polytoma* and *Polytomella*.** E. G. PRINGSHEIM (Planta, 1937, 26, 631—664, 665—691).—The utilisation of various sources of  $N$  and  $C$  by these organisms is examined (cf. A., 1937, III, 99).

A. G. P.

**Review of recent work on nitrogen metabolism of plants.** H. S. MCKEE (New Phytol., 1937, 36, 33—56).

A. G. P.

**Excretion of nitrogen by leguminous plants.** A. I. VIRTANEN (Nature, 1937, 140, 683).—A reply to criticism (cf. B., 1937, 1103).  $N$  excretion has been obtained in innumerable experiments under both natural and artificial conditions. No distinct excretion is obtained when a non-absorptive medium is used, and previous failures (*loc. cit.*) may be due to the use of coarse quartz sand. Other factors such as

bacterial strain, amount of nodules, host plant, the medium and its  $\text{NO}_3^-$  content affect N excretion.

L. S. T.

**Excretion of nitrogen by leguminous plants.** G. BOND (Nature, 1937, 140, 683—684).—Negative results with inoculated soya beans and with broad beans growing in sand are reported (cf. A, 1937, III, 284). With *Pisum sativum*, L., var. "Gradus," a small excretion of N has been observed.

L. S. T.

**Losses of nitrogen from green plants.** W. H. PEARSALL and M. C. BILLIMORIA (Biochem. J., 1937, 31, 1743—1750).—In cultures of *Chlorella vulgaris* with  $\text{NaNO}_3$  in the medium as the source of N, large losses of N occur in the dark. With  $\text{NaNO}_3$  or with  $\text{NH}_4\text{NO}_3$  in the light, the loss of N is relatively small. With leaves of *Narcissus pseudonarcissus* floating in a glucose- $\text{NO}_3^-$  medium, relatively large losses of N occur both in the light and in the dark. It is suggested that  $\text{NO}_2^-$  formed by reduction of  $\text{NO}_3^-$  reacts with the  $\text{NH}_2$  groups of  $\text{NH}_2$ -acids (cf. A., 1936, 1569).

W. O. K.

**Chemical changes of fruits ripened in presence of ethylene.** E. HANSEN (Science, 1937, 86, 272).—Evidence that  $\text{C}_2\text{H}_4$  affects certain phases of the metabolism as well as the chemical composition of the fruit is illustrated by experiments on pears. After starch hydrolysis in the fruit is completed there is a short period during which softening of the fruit is markedly accelerated by  $\text{C}_2\text{H}_4$ ; this increased rate of softening is due to an acceleration of the pectic changes in the cell walls.  $\text{C}_2\text{H}_4$  accelerates the rate of protopectin hydrolysis in gooseberries, peaches, and the Ponderosa lemon.

L. S. T.

**Use of glucose by excised tomato roots.** W. J. ROBBINS and M. A. BARTLEY (Science, 1937, 86, 290—291).—Excised tomato root tips are able to assimilate glucose. Neither the variety of tomato nor the method of sterilisation of the media is responsible for this divergence of results.

L. S. T.

**Effects of individual environmental factors on the chemical constituents of plants. I. Glucoside of flax.** N. M. FERGUSON (J. Amer. Pharm. Assoc., 1937, 26, 797—804).—The glucoside (I) content of flax is increased (as compared with flax grown under the respective opposite condition) by high  $\text{H}_2\text{O}$  content of the soil, complete exposure to daylight, and exposure to ultra-violet light during the day. The (I) of flax disappears after approx. 48 hr. in the dark, whilst the rate of decomp. of (I) in irradiated flax differs from that in non-irradiated flax.

F. O. H.

**Carbohydrate accumulation in relation to vegetative propagation of the Litchi.** W. W. JONES and J. H. BEAUMONT (Science, 1937, 86, 313).—Food reserves are important in vegetative propagation by grafting. In girdled branches of Litchi there is little change in N and sugars compared with non-girdled, but there is a 28-fold increase in starch.

L. S. T.

**Action of amylases in relation to the structure of starch and its metabolism in the plant. I. Chemical constitution of starch. II. Starch degradation by amylases. III. Amylase sys-**

**tem of barley and malt.** C. S. HANES (New Phytol., 1937, 36, 101—141).—A review. A. G. P.

**Urease distribution in plants: general methods.** S. GRANICK (Plant Physiol., 1937, 12, 471—486).—Methods of determining urease are discussed from the viewpoint that in plant tissues the enzyme exists in various states of aggregation. Two methods, (i) histological, and based on the increased alkalinity of cells as urea is hydrolysed, and (ii) chemical, depending on direct determination of  $\text{NH}_3$  formed, are described. The influence of various experimental conditions is examined.

A. G. P.

**Changes in chloroplast pigments in leaves during senescence.** B. N. SINGH and N. K. A. RAO (Nature, 1937, 140, 728).—The data recorded for leaves of *Bassia latifolia* show that during different stages of the yellowing of a leaf there is a rise in the carotenoids (I) as chlorophyll decreases. The increase in carotene is  $>$  that in xanthophyll. At shedding of the leaf, (I) practically disappear.

L. S. T.

**Kinetics of cell respiration. IV. Oxidation-reduction potentials of *Chlorella* suspensions in light and in darkness.** P. S. TANG and C. Y. LIN (J. Cell. Comp. Physiol., 1936, 9, 149—163; cf. A., 1937, III, 222).—Suspensions of *Chlorella* showed different redox potentials in light and in darkness, the former val. being more positive, sometimes by  $> 20$  mv.  $p_H$  is the same in light as in darkness except for a small, temporary change in the first 2 min. after the light is turned on or off.

M. A. B.

**Respiration of bananas in presence of ethylene.** R. GANE (New Phytol., 1937, 36, 170—178).— $\text{C}_2\text{H}_4$  is a normal metabolic product of bananas during the climacteric, when it acts as an autocatalyst.  $\text{C}_2\text{H}_4$  can be removed from air by  $\text{O}_3$  which, together with  $\text{H}_2\text{O}_2$ , I, and vaseline, retards the normal ripening of the fruit.  $\text{C}_2\text{H}_4$  increases the respiration of bananas in the pre- but not in the post-climacteric stage. Acceleration of ripening by  $\text{C}_2\text{H}_4$  is similar to that induced by volatile products eliminated by ripe fruit.

A. G. P.

**Relation between respiration and fermentation in yeast and the higher plants.** J. S. TURNER (New Phytol., 1937, 36, 142—167).—A crit. review.

A. G. P.

**Theory of assimilation. I. Theory of assimilation unit. II. Franck and Herzfeld's assimilation theory.** K. WOHL (Z. physikal. Chem., 1937, B, 37, 105—121, 122—147; cf. A., 1932, 548).—I. The mathematical development of the theory (A., 1936, 392) that approx. 2500 chlorophyll mols. transfer the energy of light quanta absorbed by them to a single  $\text{CO}_2$  mol. is presented for both continuous and intermittent illumination. The experimental data support the view that between the absorption of successive quanta by the chlorophyll- $\text{H}_2\text{CO}_3$  complex to form, by the absorption of four quanta, a product capable of yielding  $\text{O}_2$  and  $\text{CH}_2\text{O}$ , no dark reactions intervene.

II. Evidence is detailed to show that Franck and Herzfeld's theory of assimilation (A., 1937, I, 319) is untenable.

R. C.

Variations in the daily course of assimilation intensity of leaves of *Sinapis alba* in relation to internal factors. A. KJAR (Planta, 1937, 26, 594—607).—In leaves of *S. alba* the total sugar content is of the same order as that of other plants but the starch content is smaller. The rate of translocation of the assimilate is approx. equal to that of formation. Daily variations in sugar and starch contents are recorded and discussed. A. G. P.

Induction in the assimilation of carbon dioxide by green algæ. H. GAFFRON (Naturwiss., 1937, 25, 715—717).—Experiments are described which support the explanation of the induction effect in  $\text{CO}_2$  assimilation by green algæ previously put forward (A., 1937, III, 409). In some stems of *Scenedesmus* photosynthesis is much less sensitive to HCN than is respiration and splitting off of  $\text{H}_2\text{O}_2$ . Poisoned cells assimilate rapidly on exposure to light even though respiration and catalase production are almost completely stopped. In this state the assimilation is very sensitive to  $\text{H}_2\text{O}_2$ . No  $\text{H}_2\text{O}_2$  can be formed as an intermediate compound in the photosynthesis of *Scenedesmus*. The velocity of assimilation after a period in the dark under aerobic and anaerobic conditions was also investigated. The richer are the cells in reducing substances the longer delayed is the return to normal assimilation from the higher val., and the greater the difference between the velocities of assimilation under aerobic and anaerobic conditions. Under optimal conditions the velocity of assimilation is determined by the position of the equilibrium between oxidation and reduction of the photocatalyst. A. J. M.

Effect of light intensity on the photosynthetic efficiency of tomato plants. A. M. PORTER (Plant Physiol., 1937, 12, 225—252).—Diminution of light intensity increased stem and leaf production and decreased formation of fruit and photosynthetic activity. The fresh wt. of tomato plants and the % of dry matter and ash therein are closely related to the average light intensity, which is the primary factor controlling chlorophyll formation, fruit production, and photosynthetic activity. Optimum setting and development of fruit is associated with a definite level of light intensity. Basal plant metabolism and the contributory factors are regulated by the amount of light received. The influence of temp. and R.H. is examined. A. G. P.

Continuous measurement of photosynthesis, respiration, and transpiration of lucerne and wheat growing under field conditions. M. D. THOMAS and G. R. HILL (Plant Physiol., 1937, 12, 285—307).—Appropriate apparatus is described. The rate of photosynthesis in lucerne is a linear function of light intensity up to a limiting val. (52% of normal max. in Utah). Above this limit increased intensity has little effect. Rates of respiration vary with temp. and increase approx. 4-fold in the range 0—20°. In a late-season lucerne crop 16.5% of the (net)  $\text{CO}_2$  assimilated appeared in the top growth. In wheat the rate of assimilation reaches a max. in the flowering stage and subsequently declines; 83% of the total assimilation appeared in the top growth. A. G. P.

Relation of sulphur dioxide in the atmosphere to photosynthesis and respiration of lucerne. M. D. THOMAS and G. R. HILL (Plant Physiol., 1937, 12, 309—383).—Fumigation with  $\text{SO}_2$  under various conditions resulted in a decrease in the rate of photosynthesis followed by a return to normal, and in some cases > normal, levels. The effect was apparent even when fumigation caused no visible injury to the plants. Leaves absorbed considerable amounts of  $\text{SO}_2$ , part of which was excreted *via* the roots. A. G. P.

Nature of the Blackman reaction in photosynthesis. R. EMERSON and L. GREEN (Plant Physiol., 1937, 12, 537—545).—Experimental data do not support the view that the Blackman reaction involves decomp. of  $\text{H}_2\text{O}_2$  by catalase. Warburg's "acceptor" theory is worthy of consideration as a basis for constructing a theory of the mechanism of photosynthesis. A. G. P.

Photosynthesis and carbohydrate changes in the banana plant, connected with the peculiar leaf structure. A. KURSANOV and S. MANSKAJA (Bull. soc. nat. Moscou, Sect. biol., 1935, 44, 205—215).—Photosynthetic activity diminished from the base to the tips of leaves. The proportion of conducting tissue in leaves is small and products of photosynthesis accumulate in terminal areas. The leaves contain much sucrose but no invert sugar. The order is reversed in stems. Hemicellulose was abundant in all parts of the plant. CH. ABS. (p)

Lighting of plants and their leaf pigments. K. EGLE (Planta, 1937, 26, 546—583).—Transmission, reflexion, and absorption of light of various  $\lambda\lambda$  by different leaves is examined in relation to their chlorophyll-*a* and -*b*, carotene, and xanthophyll contents. In the middle zone of the spectrum and in the blue-green, chlorophyll-*b* shows stronger absorption than does -*a*. In the red-orange zone -*a* shows the greater absorption. A. G. P.

Hormones of the vegetable kingdom. REICHERT (Pharm. Ztg., 1937, 82, 1041—1043).—A brief review.

Influence of hetero-auxin on morphogenesis in *Circaea* (Sachs phenomenon). R. DOSTAL and M. HOŠEK (Flora, 1937, 31, 263—286).—Growth responses to applications of hetero-auxin-lanolin paste (I) to various organs are examined. The accelerated ageing of lower leaves of *Circaea* effected by (I) is associated with increased hydrolysis of starch and consumption of reserve substances. A. G. P.

Stimulation of cambial activity, locally in the region of application and at a distance in relation to a wound, by means of hetero-auxin. A. B. BROWN and R. G. H. CORMACK (Canad. J. Res., 1937, 15, C, 433—441).—Application of hetero-auxin-lanolin paste to cuttings of leader shoots of balsam poplar stimulated cambial activity locally and also at distance at a bridged ring on the stem, the two effects being independent. The mechanism of this action is discussed. A. G. P.

Effect of ultra-violet light on indolyl-3-propionic acid. D. HARE and H. KERSTEN (Plant Physiol., 1937, 12, 509—518).—Irradiation (Hg arc)

of the acid (I) alters its physiological action on plant roots and probably causes preliminary formation of indole (II), followed by esterification of breakdown products of the (II) ring. After 8 hr. exposures in aq. solution  $>\frac{1}{2}$  of the (I) is decomposed. A. G. P.

**Parthenocarpic fruits induced by spraying with growth-promoting chemicals.** F. E. GARDNER and P. C. MARTH (Science, 1937, **86**, 246—247).—Spraying the flowers of *Ilex opaca* with dil. aq. indolyl-acetic (I), -butyric, and -propionic acid and  $C_{10}H_7\cdot CH_2\cdot CO_2H$  (II) induced parthenocarp. (II) is the most potent, and a concn. of 0.006% caused all the flowers to set fruit. AcOH produced no effect. Watering the soil around young plants in bloom with a relatively conc. (0.15%) solution of (I) also caused some fruits to set. L. S. T.

**Algæ and growth-substances.** M. A. BRANNON (Science, 1937, **86**, 353—354).—A preliminary report of the effect of 1- $C_{10}H_7\cdot CH_2\cdot CO_2H$ , 3-indolylacetic and 3-indolylpropionic acid, and  $CH_2Ph\cdot CO_2H$  on the unicellular algæ *Chlorella vulgaris*, *C. pyrenoidosa*, and *Oocystis* sp. Concn. of 1 in  $10^4$  to 1 in  $5 \times 10^4$  were lethal, and those of 1 in  $10^5$  to 1 in  $3 \times 10^6$  had a stimulating effect on all cultures, the rate of cell reproduction being accelerated and the size of cells being increased. The optimum  $pH$  was 5.6—6.5. L. S. T.

**Plant growth-substances. XXVI. Effect of biotin, aneurin, and mesoinositol on the growth of fungi.** F. KOGL and N. FRIES (Z. physiol. Chem., 1937, **249**, 93—110).—Some of the phycomycetes, ascomycetes, and basidiomycetes do not grow on synthetic media unless one or more of the growth-substances biotin (I), mesoinositol (II), and aneurin (III) is added; others not requiring added growth-substances are stimulated in some cases by their addition.  $\beta$ -Alanine and *l*-leucine do not promote the growth of these fungi. In presence of (II) or (II) + (III), (I) at a dilution of 1 :  $25 \times 10^{10}$  stimulates the growth of *Nematospora gossypii* but the optimal concn. of (I) is 1 :  $25 \times 10^8$ . Some of the fungi not stimulated by the growth-substances probably produce their own requirements thereof and some produce (I), others (III), in amounts sufficient to promote growth of fungi which require them. W. McC.

**Effect of animal extracts on plant growth.** O. VERONA and V. SAGGESE (Riv. Biol., 1937, **23**, 221—228).—Aq. glycerol extracts of foetus (rabbit, *Anguilla vulgaris*), with or without peptic hydrolysis, diminish the % germination of wheat and its subsequent development. During growth of wheat, the extracts have a variable effect. The actions are not considered to be specifically biological. F. O. H.

**Auxin in the chick embryo. I. Its presence and the change in concentration with age.** T. W. ROBINSON and G. L. WOODSIDE (J. Cell. Comp. Physiol., 1937, **9**, 241—260).—A technique for extracting auxin (I) from animal tissues is described. (I) is present in the unincubated egg and the chick embryo, and is probably synthesised by the developing embryo. M. A. B.

**Auxin and leaf formation.** M. SNOW and R. SNOW (New Phytol., 1937, **36**, 1—18).—Effects of

auxin in stimulating the development of leaf primordia and in inducing related changes are described.

A. G. P.

**Electrical polarity and auxin transport [in plants].** W. G. CLARK (Plant Physiol., 1937, **12**, 409—440).—Apices of coleoptiles are electrically negative and the p.d. of sections  $\propto$  their length. Inversion of sections inverts their polarity. The bearing of results obtained on the translocation of auxin in plants is discussed. A. G. P.

**Growth and production of growth-substance in seedlings of *Raphanus sativus* in moist and dry air.** C. J. GORTER and G. L. FUNKE (Planta, 1937, **26**, 532—545).—Growth and cell extension in the seedlings grown in a moist atm. were  $>$  but production of growth-substance (I) was  $<$  in seedlings grown in a dry atm. Inactivation of the natural (I) of the stems of seedlings was not apparent. Auxin -A in stems is inactivated to similar extents in dry and moist atm. *R. sativus* grown in a moist atm. has the same sap concn. as when grown in a dry atm. but in the former case the cells have approx. double the elasticity and plasticity. The possibility that the (I) of *R. sativus* is not identical with auxin-A is discussed. A. G. P.

**Polarised growth and cell studies on the *Avena* coleoptile, phytohormone test object.** G. S. AVERY, jun., and P. BURKHOLDER (Bull. Torrey Bot. Club, 1936, **63**, 1—15).—Cell elongation and increase in cell nos. occur only in the long axis of the organ, i.e., growth is polarised. Cell division is probably not involved in coleoptile growth during its use in Went's hormone test. CH. ABS. (p)

**Micro-method for determining growth-substances of the A-group.** P. BOYSEN-JENSEN (Planta, 1937, **26**, 584—594).—Growth-substance (I) is extracted from plant material with  $CHCl_3$ -HCl or with  $Et_2O$ -AcOH. After evaporation of the solvent the residue is dissolved in  $Et_2O$  and transferred to an agar plate (apparatus described). The concn. of (I) in the agar is determined by the *Avena* test. A. G. P.

**Seed leaf stems of *Vicia* as indicators of the inhibitory action of growth-substance.** R. DOSTAL (Planta, 1936, **26**, 210—221).—Application of growth-substance to swollen seeds of *Pisum sativum*, *Vicia faba*, *V. sativa*, *Lathyrus sativus*, *Lens esculenta*, or *Cicer arietinum* inhibits the elongation of the seed leaf stem, the seed leaves, and roots. Seed leaves in turn affect the growth of the shoot. Treatment of the radicle inhibits the elongation of the seed leaf stem but accelerates shoot growth. A. G. P.

**Purification of traumatin, a plant wound hormone.** J. BONNER and J. ENGLISH, jun. (Science, 1937, **86**, 352—353).—A procedure is outlined. The name "traumatin" is given to the active principle of the wound hormone. Chemical properties are tentatively reported. L. S. T.

**Spike disease of sandal (*Santalum album*, Linn.). XVII. Factors relating to the abnormal accumulation of carbohydrates in diseased tissue.** A. V. V. IYENGAR (J. Indian Inst. Sci., 1937, **20**, A, 1—14; cf. B., 1935, 472).—Spiked leaves

have diastatic activity > normal, the property being retained by EtOAc extracts of leaves and by the extracted residue. Diseased leaves contain less extractable matter but higher tannin contents than healthy ones. Tannins in healthy leaves were of the pyrocatechol and those of diseased leaves of the pyrogallol type. Pyrogallol accelerated amylase activity in both healthy and diseased leaves whereas pyrocatechol inhibited the activity of diseased > that of healthy leaves. Increase in starch contents of leaves commences with the appearance of spike. At a later stage there is an increase in sugar which is not derived from accumulated starch but probably from fatty constituents of which spiked leaves contained relatively lower proportions. Starch accumulation results from defective translocation brought about by non-availability of Ca in diseased leaves.

A. G. P.

**Synthesis of natural substances, particularly alkaloids, under physiological conditions and its relationship to the question of the formation of vegetable compounds in the cell.**—See A., II, 526.

**Determination of coumarin in sweet clover. Comparison of the steam-distillation and alcoholic-extraction methods.** I. J. DUNCAN and R. B. DUSTMAN (Ind. Eng. Chem. [Anal.], 1937, 9, 471—474; cf. B., 1937, 1406).—Extraction gives low vals., whilst the amount removed by one steam distillation is a const. proportion of the total coumarin (I), which is entirely removed by four distillations. (I) in the distillate is determined colorimetrically.

F. R. G.

**Odorous substances of green tea. IX. Carbonyl compounds of black tea oil.** S. TAKEI, Y. SAKATO, and M. ONO (Bull. Inst. Phys. Chem. Res. Japan, 1937, 16, 773—782).—Oil from black Formosa tea dust contains CHMeEt·CHO, Bu<sup>δ</sup>CHO, Pr<sup>δ</sup>CHO, Pr<sup>ε</sup>CHO, COMeEt, PhCHO, a C<sub>5-6</sub> ketone, and a ketone C<sub>6</sub>H<sub>12</sub>O (cf. A., 1936, 125). From green tea oil, only PhCHO is isolated. Δ<sup>α</sup>-Hexenaldehyde cannot be detected in black tea oil (cf. A., 1935, 796).

E. W. W.

**Essential oil of black tea. III.** R. YAMAMOTO and K. ITO (Bull. Agric. Chem. Soc. Japan, 1937, 13, 736—750; cf. A., 1935, 1289).—The oil obtained by steam distillation of Formosan black tea contains EtCO<sub>2</sub>H, Bu<sup>δ</sup>CO<sub>2</sub>H, *n*-hexoic, hexenoic, octoic, palmitic, and salicylic acids, hexenol, hexanol, *n*-octanol, linalool, hexaldehyde, PhCHO, *o*-, *m*-, and *p*-cresol, quinoline, and an unidentified S compound, b.p. 102—112°.

J. N. A.

**Wax from the leaves of sandal (*Santalum album*, L.).** A. C. CHIBNALL, S. H. PIPER, H. A. EL MANGOURI, E. F. WILLIAMS, and A. V. V. IYENGAR (Biochem. J., 1937, 31, 1981—1986).—The saponified wax yields a small amount of fatty acid, the unsaponifiable material consisting of palmitone (*n*-hentriacontan-16-one), 44%, d-10-hydroxypalmitone, m.p. 96.4—96.6°, 6%, and mixed primary alcohols (approx. 75% of *n*-C<sub>28</sub>H<sub>57</sub>·OH and 25% of *n*-C<sub>30</sub>H<sub>61</sub>·OH), 50%; no paraffin is present. *n*-Hentriacontane-10:16-dione, m.p. 87.9—88.1°, d-*n*-hentriacontan-10-

*ol*, m.p. 81—81.2°, and *n*-triacontan-15-one, m.p. 78.8—79.2°, were prepared.

F. O. H.

**Separation of carbonyl compounds from wax.** H. A. EL MANGOURI (Biochem. J., 1937, 31, 1978—1980).—Ketonic substances in wax condense with *p*-carboxyphenylhydrazine (Anchel and Schoenheimer, A., 1936, 989) in presence of AcOH and C<sub>5</sub>H<sub>5</sub>N and the hydrazones are separated from the non-reacting components by dissolution of the Ba salts in boiling MeOH and regenerated by treatment with alcoholic CH<sub>2</sub>O or AcCO<sub>2</sub>H. The application of the method is exemplified.

F. O. H.

**Component fatty acids of the phosphatides of soya bean and rape seeds.** T. P. HILDITCH and W. H. PEDELTY (Biochem. J., 1937, 31, 1964—1972).—The principal fatty acids in the phosphatides of soya bean are palmitic (I), hexadecenoic (II), oleic (III), and linoleic (IV) with small amounts of stearic, arachidic, linolenic, and C<sub>20</sub> unsaturated acid. Rape seed phosphatides contain (III), (IV), and erucic, with smaller amounts of myristic, (I), (II), and acids equiv. to behenic acid. Comparative data for glyceride-fatty acids are also given.

F. O. H.

**Unsaponifiable matter of algal fats. III. Toxic components.** K. SHIRAHAMA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 705—709; cf. A., 1936, 1307).—Injection of the unsaponifiable matter (sterol-free) from the fat of *Alaria crassifolia*, *Cystophyllum hakodatense*, and *Laminaria ochotensis* into rats produced the characteristic cramp and narcotic effects which are given by the toxic compounds of cod-liver oil (Kawakami and Yamamoto, A., 1935, 233).

J. N. A.

**Pectic substance of plants. V. Nature of pectin and pectic acid.** F. W. NORRIS and C. E. RESCH (Biochem. J., 1937, 31, 1945—1951; cf. A., 1937, III, 367).—Pectins (I) prepared by different methods from different sources (orange peel, apple, beet, hops) show the same general characters but differ significantly in detail of constitution. Pectic acid (II) prepared from (I) is not a chemical entity, its composition depending on the period of treatment of the cell-wall material with alkali [which increases the uronic acid content of the resultant (II)] and (NH<sub>4</sub>)<sub>2</sub>C<sub>2</sub>O<sub>4</sub>.

F. O. H.

**Quercetin glucoside from *Trifolium* flowers.** S. HATTORI, M. HASEGAWA, and K. HAYASHI (Acta Phytochim., 1937, 10, 147—153).—The trifoliin (I) and isotrifoliin of Nakaoki (J. Pharm. Soc. Japan, 1933, 53, 238) from the flowers of *Trifolium repens*, L., are shown to be identical. (I) is shown by mixed m.p. to be identical with isoquercitrin and gives a (OMe)<sub>4</sub>-derivative, m.p. 222°, which on hydrolysis yields 5:7:3':4'-tetramethylquercetin.

P. W. C.

**Fructosides of Amaryllidaceæ. *Lycoris* and *Narcissus*.** H. BELVAL (Bull. Soc. Chim. biol., 1937, 19, 1158—1163).—Leaves of *L. squamigera*, Max., and *L. radiata*, Kunth., contain besides starch two fructosides, *lycoroside-A*, [α] —34°, containing fructose and 10% of glucose, and *lycoroside-B*, [α] —20°, which is identical with asphodeloside (I). *N. pseudonarcissus*, L., contains only starch and (I).

P. W. C.

Ferric salts as precipitants in the extraction of certain heterosides. R. LUNEAU (J. Pharm. Chim., 1937, [viii], 26, 256—259).—Hérissey and Laforest's technique (cf. A., 1932, 662) is modified by the use of  $\text{Fe}_2(\text{SO}_4)_3$  instead of  $\text{Pb}(\text{OAc})_2$ . J. L. D.

Vitamin-C and its derivatives in the South American bark, *Chuchuhuasha*. E. PERROT, L. MILLAT, and R. COLAS (Bull. Sci. Pharmacol., 1937, 44, 325—328).—The total -C content of the bark is approx. 1.2 g. per kg., of which one third is in the reduced form. In leaves the proportion of reduced to esterified -C is 1 : 3. Root bark contains a glucoside of -C, m.p. 172°, together with an alkaloid, a flavone pigment, a pyrocatechol tannin, and a phytosterol.

Colloidal reactions of cellulose membranes. W. K. FARR (J. Physical Chem., 1937, 41, 987—995; cf. A., 1935, 1541).—The structure and properties of plant membranes are discussed. F. L. U.

Composition of some less common vegetable fibres. Structure of cellulose.—See B., 1937, 1185.

Biological decomposition of lignin. A. G. NORMAN (Sci. Progr., 1936, 30, 442—456).—A review. CH. ABS. (p)

Fluorescence and photodecomposition of solutions of chlorophyll-*a* under oxygen, carbon dioxide, and nitrogen.—See A., I, 549.

Reversible oxidation of chlorophyll.—See A., I, 629.

Monolayers and multilayers of chlorophyll.—See A., I, 613.

Constitution of cerberin.—See A., II, 513.

Sapogenin of *Gleditschia horrida*, Nakino.—See A., II, 512.

Biological value of the proteins of certain cereals. Z. MARKUZE (Biochem. J., 1937, 31, 1973—1977).—Tabulated data for common Polish cereals fed to rats give the series fine buckwheat meal (2.98) > whole buckwheat groats > rolled oats > barley meal > rice, semolina, whole wheat grain > wheat flour > millet meal (0.95). F. O. H.

Hydrolytic properties of *Carica papaya* latex and latex preparations. M. FRANKEL, R. MAIMIN, and B. SHAPIRO (Biochem. J., 1937, 31, 1926—1933).—The latex hydrolyses both gelatin (I) and peptone (II). The Et<sub>2</sub>O-insol. fraction may be separated to give a centrifugate with the properties of papain. The supernatant liquid, treated with EtOH, yields a ppt. with a lower activity towards (II), and contains a thermostable activator of (II) but not of (I)-cleavage. No activator was found in the fruit press juice.

H. G. R.  
Composition of the pollen of some Ranunculaceae and their systematic position. C. S. BOURDOUIL (Compt. rend., 1937, 205, 336—337).—Analyses are recorded of the total N in the pollen of different members of this family. Pollen of species of the *Aquilegia* type contains about 7%, that of the *Clematis* type 5.5%, and that of the *Ranunculus*

type 4.4% of total N. Morphologically similar members of the family have pollen of approx. the same total N content. J. L. D.

Histo-chemical investigations of lignified cell-walls. J. KISSER and K. LOHWAG (Mikrochem., 1937, 23, 51—60).—The tangential wall of newer pine cells is much more readily swollen than the radial wall or the wall of old wood. This explains the characteristic disintegration produced in this wood by *Fomes Hartigii*, which spreads principally in old wood and disintegrates the tangential walls. Mechanical strain of lignified cell walls causes a mechanical decomp. and such walls then give the cellulose reaction without previous delignification. J. W. S.

Determination of arsenic in small amounts in biological materials. H. J. MORRIS and H. O. CALVERY (Ind. Eng. Chem. [Anal.], 1937, 9, 447—448).—After preliminary treatment of the sample with  $\text{H}_2\text{SO}_4$ ,  $\text{HNO}_3$ , and then  $\text{HClO}_4$ , As is liberated as  $\text{AsH}_3$ , collected in a heated glass tube as an As mirror, dissolved in  $\text{HNO}_3$ , and determined colorimetrically with  $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$  and  $\text{N}_2\text{H}_4 \cdot \text{H}_2\text{SO}_4$  with the aid of a spectrophotometer. E. S. H.

Determination of bismuth in body-fluids and tissues. A. J. LEHMAN, A. P. RICHARDSON, and P. J. HANZLIK (J. Lab. Clin. Med., 1935, 21, 95—97).—Improvements in the method of Hanzlik and Mehrtens (Arch. Dermatol. Syphilol., 1930, 22, 483—495) permit determination of 0.001 mg. of Bi.

CH. ABS. (p)  
Determination of lead in biological materials. Comparison of spectrographic, dithizone, and *s*-diphenylcarbazine methods. J. CHOLAK, D. M. HUBBARD, R. R. McNARY, and R. V. STORY (Ind. Eng. Chem. [Anal.], 1937, 9, 488—490).—For ordinary work involving >1  $\mu\text{g.}$  of Pb the spectroscopic and dithizone methods are equally satisfactory; for <1  $\mu\text{g.}$  of Pb the spectrographic method is superior. The carbazine method is useful for large samples and satisfactory when the Pb content is such that the loss inherent in the method (approx. 0.07 mg. per sample) is insignificant. E. S. H.

Determination of lead. Photometric dithizone method as applied to biological material. D. M. HUBBARD (Ind. Eng. Chem. [Anal.], 1937, 9, 493—495).—The solution of the ash of the material is extracted with dithizone in  $\text{CHCl}_3$  in three steps and the Pb content of the extract determined photometrically. If Bi is present, it must be removed, but other metals usually found in biological materials do not interfere. With amounts of Pb <10  $\mu\text{g.}$  the error is about 0.8  $\mu\text{g.}$  E. S. H.

Spectroscopic determination of metals in small samples [of plant ash]. Calcium, magnesium, potassium, manganese, iron, and phosphorus. D. T. EWING, M. F. WILSON, and R. P. HIBBARD (Ind. Eng. Chem. [Anal.], 1937, 9, 410—414).—The sample is dissolved in a solution containing NaCl 5, HCl 4.5, and  $\text{NH}_4\text{Cl}$  45 g. per litre. The conditions of arc excitation, exposure, etc. required to give the max. gradation of density for the selected spectral lines have been determined.

E. S. H.